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A Pharmacist, No More Than Any Other Person, Can Do No More Than He Can, But He Should Do All He Can for the Advancement of Pharmacy.

Vol. XXIV, No. 4 APRIL, 1935

JOURNAL
OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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Published Monthly by the American Pharmaceutical Association: Office of Publication, 20th & Northampton Sts., Easton, Pa. Editorial Office, 2215 Constitution Ave., Washington, D. C. Annual Subscription, $4.00; Canada, $4.35; Other Foreign, $4.50; Single Numbers, 35 cents; Canada, 40 cents; Other Foreign, 50 cents.

THE 83rd ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN PORTLAND, ORE., AUGUST 5–10, 1935.

Local Secretary, A. O. Mickelsen, N. E. 6th Ave. at Oregon St., Portland, Ore., Hotel Multnomah, Headquarters.

The 1935 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conference of Pharmaceutical Association Secretaries, of the Pharmaceutical Law Enforcement Officials and the Plant Science Seminar will also be held in Portland.

Entered as second-class Matter, January 23, 1917, at the Post Office at Easton, Pa., under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103. Act of October 3, 1917; authorized July 10, 1918

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E. F. KELLY, Secretary,
2215 Constitution Ave.,
Washington, D. C.

NATIONAL PHARMACY WEEK.

The eleventh annual observance of the National Pharmacy Week movement will be held during the week of October 21st. It has been advisable to change the date to two weeks later than in previous years so as to allow the colleges of pharmacy greater opportunity to participate. In the past very little time elapsed between the opening dates of the scholastic year and Pharmacy Week.

The tenth annual observance for the year 1934 was more widely participated in by retail pharmacists than for many years. The office of the National Pharmacy Week Executive Committee was flooded with requests for copies of the human interest-appeal stories. It is gratifying to note that many pharmacists are utilizing materials of this kind throughout the entire year by arranging for presentation of these talks before various community organizations.

An outstanding event of the 1934 observance was the splendid radio address delivered by President Robert P. Fischelis, of the AMERICAN PHARMACEUTICAL ASSOCIATION, over a nation-wide hookup. Radio addresses were delivered by retail pharmacists and educators in many sections of the country.

The Robert J. Ruth Memorial Trophy, a silver loving cup donated by the Federal Wholesale Druggists' Association, through Secretary Lee Williamson has been awarded to Apothecaries Hall, New Haven, Connecticut. The 1934 National Pharmacy Week Window Display Contest Committee was composed of leading members of the Drug Trade Industry of New Orleans, with Professor John McCloskey serving as chairman.

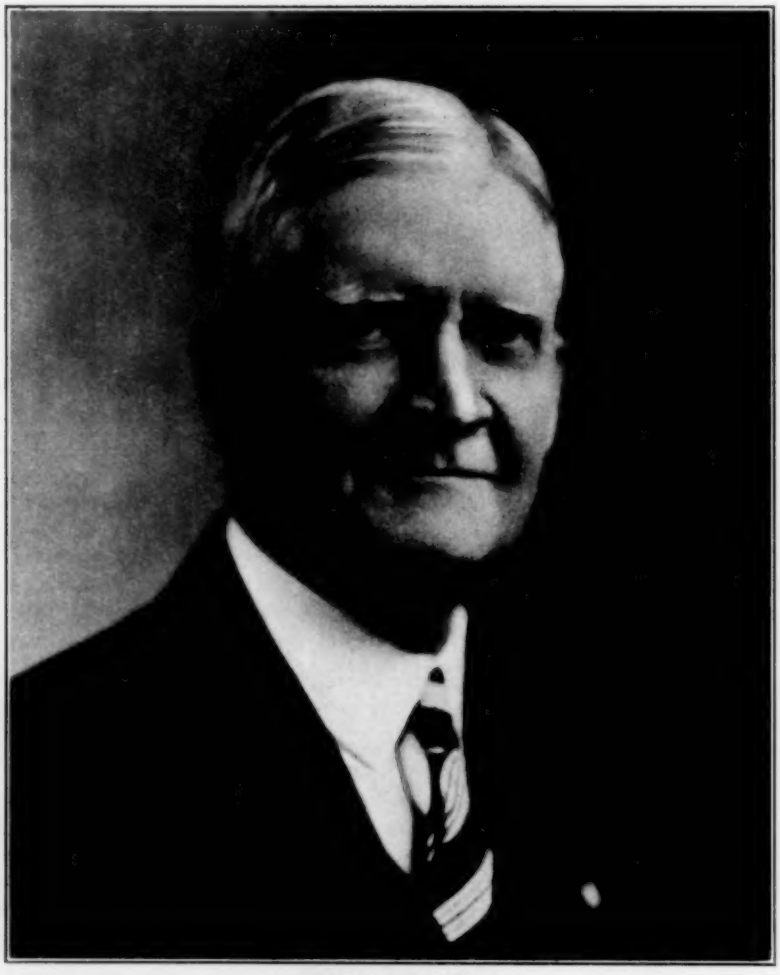
The National Pharmacy Week movement is now entering upon its second decade of life which speaks well for those who have been responsible for the success of same. It has gone forward for a decade growing in strength year by year and has been kept within the tenets and precepts of the ideals as laid down by its founder. Throughout the country retail pharmacists are devoting more thought and attention to the professional aspects of their daily activities which no doubt is due in a large measure to the activities of the Pharmacy Week movement.

The National Pharmacy Week Executive Committee is now at work on the plans for the 1935 observance which beyond a doubt will prove to add another mile-stone to the success of a movement that has done much for the profession of pharmacy in bringing its message to members of allied professions and to the laity.

The National Pharmacy Week Executive Committee urges retail pharmacists to begin planning now for the professional window display that they are contemplating featuring during the week of October 21st. An attractive and interesting professional window display requires of the pharmacist a review of the literature of the subject selected, followed in turn by preparation of well-worded copy for show-cards, assembling of materials and, finally, the arrangement in a dramatic manner.

Pharmacy as a profession is replete with romance and many great achievements in its interesting history and it is hoped that thousands of retail pharmacists will browse through the dust-laden archives and bring to light many of these interesting stories by means of professional window displays and talks before various community organizations.

ANTON HOGSTAD, JR., *Chairman.*



WILLIS G. GREGORY.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XXIV APRIL, 1935 No. 4

WILLIS G. GREGORY.

Willis George Gregory is concluding his 50th year of membership in the AMERICAN PHARMACEUTICAL ASSOCIATION. He was chairman of the first and second editions of the Pharmaceutical Syllabus, prepared by the National Pharmaceutical Syllabus Committee; he is the senior pharmacy dean of the American schools of pharmacy, and for 20 years he has been a member of the New York State Pharmacy Council in the State Education Department. He was a member of the Revision Committee of the United States Pharmacopœia, 1890–1920; a former president of New York State Pharmaceutical Association of which he is a life member, and for 33 years has been a member of the New York State Board of Pharmacy. When the AMERICAN PHARMACEUTICAL ASSOCIATION met in Buffalo, in 1924, Professor Gregory served as local secretary.

Willis G. Gregory was born April 19, 1857, the son of Willis Lathrop and Frances (Beach) Gregory, the seventh generation from John Beach ("Ye Pilgrim") of New Haven, Conn. He received his early education in Buffalo, the degree of M.D. from the University of Buffalo, in 1882, and graduated in pharmacy in 1886. Professor Gregory became a member of the pharmacy faculty, University of Buffalo, in 1886, and was elected dean in 1890, which office he still holds.

The subject of this brief sketch entered pharmacy in 1869 as apprentice in the pharmacy of his father, became a partner and, in 1887, proprietor until he retired in 1912. He has been active in local and state pharmaceutical organizations, is a member of the American Association of University Professors and of the Council (Trustees) of the University of Buffalo.

Dr. Gregory married Gertrude Fargo, of Buffalo, April 14, 1885; they had four children, two of whom are living—Louise, born 1890, and Frances, born 1901.

EDITORIAL

E. G. EBERLE, EDITOR 2215 Constitution Ave., WASHINGTON, D. C.

SIXTH INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY.

THE report of Commander William Seaman Bainbridge for the delegation from the United States has been issued in book form as Conference Series No. 12 of the Department of State, the Foreword is by the Surgeon General of the U. S. Army, Robert U. Patterson.

Among the contributors to the Congress were: Carlo Gorreta, Major Pharmacist-Chemist, Italy; Pharmacist-Colonel Morreau and Pharmacist-Commandant Raynaud, France; Jules Thomann, Colonel-Pharmacist of the Swiss Armies, Switzerland. Among the official delegates holding military titles and positions as pharmacists were: I. Etienne and W. Proot, Belgium; G. H. Barthet, F. Chaput, A. Saint-Sernin, France; S. Krupinski, Poland; Guerrero Rafael Roldan, Spain; J. Thomann, Switzerland. Other officers were present but not distinctively mentioned as pharmacists.

Among the conclusions unanimously adopted were: "The training of the military medical officer and pharmacist must embrace the medical or pharmaceutic science and military instruction. The training of military medical officers and pharmacists must be entrusted to the civilian faculties. It is desirable that throughout their career, military medical officers and pharmacists should attend courses of instruction in both professional and military subjects."

Military-Pharmacist, First Class, L. J. Roehner, of the Netherlands, contributed a paper on the preparation and storage of medicinal ampuls. Chief Pharmacist, Colonel G. Grintzesso and Captain J. Bibesco, Rumania, made a report based on a selection of the most practical, expeditious and reliable methods for the preparation of injection solutions. Chief Pharmacist-Chemist, First Class, A. Saint Sernin, France, contributed a tabulation of twenty-one medicinal ampuls in use in the French Navy, with data on their mode of sterilization and the length of time of their preservation, ranging from six months to three years. Pharmacist-Colonel Morreau and Pharmacist-Commandant Raynaud, France, reported on the preparation and preservation of medicinal ampuls in use in the service of the Armies on land and sea. Chemist-Pharmacist Colonel Fillipo Suzzi, Italy, briefly summarized the contributions made during about thirty years by the Italian Military Medical Service, through its investigations, methods and appliances of the many problems of pharmaceutical technique, with respect to the preparation and preservation of medicinal agents for hypodermic use, and with special reference to studies along the line of composition of the glass for the flasks. Major Pharmacist-Chemist Carlo Gorreta, Italy, gave a résumé on the preparation and preservation of ampuls in use by the Auxiliary Service of the Armies and Navies. Colonel Thomann, Pharmacist-in-Chief in the Swiss Army, reported on the preparation and preservation of ampuls and fluids for injection.

These comments are of necessity very brief, the reports and papers go into careful detail and testify to an essential service by pharmacists in the armies and navies which, unless reported, fail to receive proper credit.

The Eighth International Congress of Military Medicine and Pharmacy will be held in Brussels, June 27th to July 3rd.

HOSPITAL DISTRIBUTION AND HOSPITAL SERVICE.

THE issue of the *Journal of the American Medical Association* for March 30th is the annual Hospital Number—always an informative publication; the issue of this year presents the report more comprehensively and represents a most valuable service of the Council on Medical Education and Hospitals. The maps give what may be termed a bird's-eye view of the hospital distribution, and enables those who study the situation to make deductions relative to the service rendered and the distribution of the institutions, geographic and otherwise.

The *Journal* comments editorially on the development of hospitals in rural and urban areas and makes deductions relative to the need of further extension, and also points out the possibilities of going beyond the needs of hospital requirements when compared with the demand and support for the institutions. This comment is to express appreciation of the annual study and the service rendered by the *Journal of the American Medical Association.*

VARIATION IN THE CONTRIBUTORY HARMFULNESS OF PETROLEUMS.

THE Manchester Cancer Committee is investigating petroleum oils and tars from the standpoint of their harmfulness as contributory causes of cancer. It seems that two oils from the same region rarely exhibit identical potencies, but the report is that the oils of some sections are less harmful than that of other territories. It may still be questioned whether the classification has gone far enough to report results definite and accurate; however, foundation has been laid by Dr. C. C. Twort for further research which will interest investigators of our profession and other research workers. The investigations may lead to discoveries other than the causes for high mortality from cancer in oil fields and petroleum refineries.

A BILL FOR EXTENDING THE LIFE OF THE NRA.

S. 2445 (by Senator Harrison) seeks to extend the life of the NRA. Coöperating, by delaying a decision on the constitutionality of the National Industrial Recovery Act, the Solicitor General will ask (?) the Supreme Court to dismiss the government's own appeal in the Belcher case. "After the dismissal of the appeal, the Supreme Court's docket will not include any case in which that tribunal might have the opportunity of deciding a broad issue relating to the National Recovery Act." There seems, therefore, no immediate prospect of a final decision by the Supreme Court in an NRA case.

Press opinions are to the effect that the decision was reached as being preferable to have flaws in the measure removed by legislation rather than to risk a decision by the Supreme Court holding the present statute invalid on the ground of an unconstitutional delegation by Congress of its legislative authority and thereafter remedy the defect. Seemingly, this action delays enforcement of the codes in certain particulars; on the part of a minority there is a purpose to proceed with the appeal of the Belcher case. (This comment was written prior to court action.)

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS.—*Chairman*, F. E. Bibbins, George D. Beal, L. W. Rising, H. M. Burlage, L. W. Rowe, John C. Krantz, Jr., Heber W. Youngken.

THE QUANTITATIVE DETERMINATION OF ALKALOIDS WITH BROMINE.*

BY ROBERT A. HATCHER AND ROBERT L. HATCHER.

Hart (1) reported that one molecule of quinine in solution absorbs four atoms of bromine, and that the former could be estimated quantitatively by means of $N/10$ bromine solution, 1 cc. of which is decolorized by 8.1 mg. of quinine.

Weiss and Hatcher (2) described a method for the quantitative estimation of small amounts of quinine and quinidine in pure solutions and in those which contain extracts of tissue, by means of an aqueous solution of bromine. The method depends on the absorption of the bromine, the end-point being the disappearance of the yellow color. Haag (3) reported that this method may be used for the quantitative determination of brucine, caffeine, cinchonidine, procaine, strychnine, theobromine and certain other alkaloids; but that it is not available for the estimation of atropine, cocaine, morphine, sparteine and certain other alkaloids.

In the course of studies involving the quantitative estimation of morphine in extracts of animal tissues, it was found that the presence of very small amounts of impurities sometimes interfered with the quantitative colorimetric determination of morphine by means of Marquis' reagent, and it was decided to investigate the availability of bromine solution for the estimation of morphine and various other substances.

TECHNIQUE.

The general method is as follows: Dilute 1 volume of the official (U. S. P. X) $N/10$ bromine solution with 9 volumes of distilled water. Dissolve the substance to be tested in distilled water; in the case of alkaloids in the proportion of $^1/_{400}$ of the molecular weight in grams in 1 liter. Place 1 cc. of $N/100$ bromine solution in each of a series of colorless or greenish (not yellowish) test-tubes of about 18 cc. capacity and of about 14-mm. diameter; add the solution of the substance to be tested in successively increasing volumes; then add 0.3 cc. of about 12 per cent HCl to each tube, and after the reaction is complete (or after thirty minutes), observe in which tubes the color of bromine persists. The tube is held at right angles to the light, preferably from a northern exposure—not in direct sunlight—and the solution is observed transversely. The end-point is the mean of the largest volume which fails to discharge the color of bromine, and the smallest volume which decolorizes it completely. If a greater degree of precision is necessary, the experiment is repeated with less difference in the successive volumes of the solution added to the bromine solution. Solutions of the substance of known concentrations, which in every case should approximate that of the one being examined, should be used in exactly the same way as a control. Moderately dilute solutions of all substances, the concentrations of which were not known to the observer, were used, the strength of the controls being known. Solutions of greater dilutions, differing in concentration by 10 per cent, and designated only by letters "A," "B" and "C," were classified correctly by the test. The combining powers of alkaloids vary; for example, one molecule of cinchonidine decolorizes two atoms of bromine, one molecule of procaine de-

* From the Department of Pharmacology, Cornell University Medical College, New York City.

Received February 23, 1935.

colorizes four, in moderate concentration, but the proportions are less exact with increasing dilution. That concentration which combines quantitatively with an equal volume of $N/100$ bromine solution is conveniently termed the "Standard Solution" of that particular substance. The concentrations of such "Standard Solutions" vary from 1–447 in the case of cinchonine, to 1–5850 in the case of antipyrine.

As little as 0.1 cc. of $N/1000$ bromine may be used for testing substances in very low concentrations. Where the concentration of bromine in the mixture of reagents is less than that of $N/5000$, 0.5 cc. of about 24 per cent HCl is used, and an interval of at least ten minutes is allowed for the release of the bromine and its combination with the substance to be tested.

A preliminary test for solutions of moderate concentration is made as follows: To 1 cc. of $N/100$ bromine solution in a test-tube, add 0.3 cc. of 12 per cent HCl, then the solution to be tested is added slowly from a pipette graduated in $^1/_{100}$ cc. until the color of bromine is discharged. In order to facilitate the detection of the least tinge of color due to bromine, comparison is made with a control in which there is a slight excess of the substance under examination. The average of several tests is taken. For some substances this test is about as accurate as either of the modified methods.

First Modification.—After the reaction is complete, 0.25 cc. of chloroform is added and the tube is shaken. Any free bromine is taken up by the chloroform, which assumes a yellowish tint. In some cases the end-point in the first method is obscured by the development of color. In such cases the use of chloroform is necessary, but even this fails in those cases where the color other than that of bromine appears in the chloroform.

Cloudiness develops slowly in the chloroform in the presence of a trace of bromine, too slight to afford a tint, but since cloudiness is also induced under conditions that cannot be controlled, it was utilized in only a few tests. It may afford an extremely delicate test under conditions that avoid the disturbing factors.

Second Modification.—In some cases with moderate concentration, and in all cases with very low concentration, neither the general method nor the use of chloroform affords satisfactory results; in such cases a fraction of a milligram of apomorphine is added, and the test-tubes are shaken. A trace of free bromine (about 1–600,000) is indicated by a pink color appearing within thirty seconds. The mean of the results of several determinations is accepted as the end-point. Immediately after the addition of the apomorphine the observation is made obliquely downward through the solution. As previously stated, rather rigid control solutions are necessary, hence one must know roughly the concentration of the solution under examination.

The following factors concerned with the technique have received consideration:

1. *Time of Reaction:*
   - (*a*) Substances which react slowly with bromine may require thirty minutes after the addition of HCl.
   - (*b*) The chloroformic extraction of free bromine requires from a few seconds to one minute.
   - (*c*) Apomorphine reacts rapidly with free bromine and since it displaces some substances slowly the mixture is observed within thirty seconds.
   - (*d*) The rate of the reaction of codeine sulphate, heroine hydrochloride and morphine sulphate is accelerated by H_2SO_4, the acceleration increasing with the concentration of H_2SO_4.

2. *Concentrations:*

   (*a*) Bromine in very dilute solutions is extracted imperfectly by chloroform, and less than 1 in 600,000 is not detected even with apomorphine; hence the comparison of a very dilute solution of unknown concentration with a much more concentrated control would result in a large error.

   (*b*) The concentration of HCl required to liberate bromine rapidly varies with the concentration of the latter, but an excess of HCl should be used, the optimum being 0.3 cc. of 12 per cent HCl per cc. of $N/100$ or $N/1000$ Koppeschaar; very low concentrations of the solutions require as much as 0.5 cc. of 20 per cent HCl.

   (*c*) There is no exact limit to the dilution of a substance which may be estimated with a bromine solution, since the error increases with dilution. It is not usually feasible with chloroform to employ a solution of less than Standard/100 (1/100 the concentration of that which decolorizes an equal volume of $N/100$ bromine solution). When apomorphine is used without the addition of chloroform, the concentration in some cases may be Standard/400.

3. *Volatilization of Bromine:* (*a*) The loss of bromine through volatilization depends partly on the volume, more on the depth, of the solution. The loss is negligible with rapidly reacting substances but must be considered with those which react slowly. The loss of bromine is minimized by adding the HCl after having added the Solution to be tested. Heat accelerates the reaction but it may increase the loss of bromine. Brucine sulphate and codeine sulphate were estimated at 25° and 32° C. with an interval of thirty minutes for completing the reaction. In each case there was a difference of about 5 per cent due to the greater loss of bromine at the higher temperature. Slight differences of temperature are not important in estimating substances which react rapidly with bromine.

   (*b*) The loss of bromine is one of the chief objections to the use of the unofficial solution of bromine which Weiss and Hatcher employed. This may be minimized by using a micro-burette having a three-way stop-cock connected with an all-glass syringe. The tip of the syringe must be in contact with the intake of the burette in order to avoid the action of bromine on rubber tubing.

4. *Illumination:* Light and the background influence the precision of borderline observations. Daylight, and electric light with a blue lamp are satisfactory. White, unglazed paper affords the best background.

5. *Cloudiness in the Chloroform:* This appears eventually in the chloroform in solutions in which there is one part of free bromine in two millions; but it was of little value in our experiments because it occurred at times from unknown causes. It appears in chloroform underlying water when concentrated HCl is added, but not when chloroform is added to any concentration of HCl. Occasionally a tinge of color of unknown origin (having no relationship to the presence or absence of free bromine) appeared in the chloroform.

The simple description of the technique and statements of the approximate *average* error in the estimations of various substances would make the method appear more simple and accurate than it will be found in individual cases unless one has had practice, and will devote the necessary time to the estimation. The results presented here are based on a very large number of experiments involving many thousands of test-tube examinations.

Amidopyrine.—The simple decolorization method proved more satisfactory than the chloroform modification in the estimation of concentrations up to 1–30,000. For more dilute solutions this method is not practical. When an excess of amidopyrine is added, a purple color may appear, irregularly, it fades after a few minutes.

The chloroform modification is less satisfactory because of the pink color which appears in the chloroform and interferes with borderline observations; it also interferes with the apomorphine test when apomorphine is added after chloroform, but not if the chloroform is omitted.

It is probable that concentrated solutions (up to about 1–5000) may be estimated with errors of 3 per cent by the decolorization method; the error being slightly greater with chloroform. Apomorphine without chloroform affords a more accurate and more delicate test, and it was used satisfactorily with concentrations as low as 1–700,000.

Antipyrine.—The reaction requires about two minutes. The error with chloroform may be as high as 2 or 3 per cent for concentrated solutions because of the development of a slight color. Less of antipyrine than of any other substance used is required to decolorize 1 cc. of bromine solution, and satisfactory estimations of it in concentration of 1–1,200,000 were made with apomorphine.

Apomorphine Hydrochloride.—The reaction with bromine begins at once but it requires some time for its completion when only traces are present. A pink or intense red color develops, dependent on the concentration; the chloroform takes up part of this color which interferes with the precision of the observations. One part of bromine in 600,000 parts of water may be detected with an excess of apomorphine. One part of apomorphine in 1,200,000 parts of water affords a pink tint with an excess of bromine. This affords a means of determining roughly the amount of apomorphine present in solution.

Brucine Sulphate.—The reaction requires about thirty minutes, and a slight color develops in the solution, hence the simple decolorization method is unsatisfactory. The chloroform modification affords a satisfactory result. Apomorphine is useful with concentrations of 1–40,000, or less, but not with much more concentrated solutions of brucine.

When brucine sulphate is added after the addition of HCl to bromine solution, a pink color develops immediately and changes rapidly to yellow, then to orange, and finally to pink with an excess of brucine sulphate. Hence it is possible to estimate the amount of brucine sulphate by this method. After the addition of chloroform the supernatant liquid in all tubes remains, or becomes, deep pink.

Caffeine.—The reaction requires about twenty minutes and the solution develops a slight color, hence the simple decolorization method is unsatisfactory, but the chloroform and apomorphine modifications afford satisfactory results. After the addition of chloroform a slight color appears in the chloroform. This must be disregarded, but it interferes only slightly with the observation of borderline cases. Dilutions up to 1–165,000 were estimated by both modifications with moderate errors.

Codeine Sulphate.—The reaction requires about thirty minutes. The chloroform and apomorphine modifications may be used for the estimation of concentrations of about 1–100,000. Apomorphine was not used with more dilute solutions. The decolorization method is unsatisfactory because of the development of a yellow color. In general, codeine behaves about like morphine.

Cinchonidine and Cinchonine.—The reaction is almost instantaneous. Solutions of 1–1000 may be estimated with an error of less than 1 per cent. In concentration of 1–100,000 the error is about 5 per cent. There was no appreciable difference in the results when these alkaloids were dissolved in 0.1 per cent, or 1.6 per cent sulphuric acid.

In a few experiments with cinchonine and some other substances a green color was observed in some of the test-tubes after the addition of apomorphine; this was not investigated further.

Dionine.—The reaction occurs slowly and there develops in chloroform a color which interferes with borderline observations. Only preliminary tests were made.

Emetine.—The reaction occurs slowly, and the solution becomes yellow. Chloroform-soluble emetine may be estimated by substituting ether for chloroform, but the reflection of the yellow color on the ether makes borderline observations uncertain.

Morphine Sulphate.—The reaction is practically complete in thirty minutes. The resulting solution develops a color resembling that of bromine, hence the simple decolorization method cannot be used, but this color does not pass into the chloroform; and the chloroform modification affords a satisfactory test. The error is less than 1 per cent for solutions up to 1–3000, and about 5 per cent for concentrations of about 1–200,000. The apomorphine test is applicable to very dilute solutions, and concentrations of about 1–420,000 were estimated with errors of about 5 per cent.

Procaine and Tutocaine.—The reactions are very rapid. Solutions of 1–2000 may be estimated with an error of less than 1 per cent; in concentrations of 1–300,000 the error is about 5 per cent.

Quinine and Quinidine.—These may be estimated by adding to the point of decolorization probably better than by the chloroform and apomorphine modifications, but one of us (R. L. H.) could not estimate them with errors of less than 10 per cent, owing to the development of a yellowish color, which, however, was invisible to the other (R. A. H.).

Strychnine Sulphate.—The reaction requires about ten minutes. Satisfactory estimations were made with dilutions up to 1–100,000. A few tests of solutions of about 1–150,000 gave errors of about 10 per cent.

Theobromine.—The chloroform and apomorphine modifications afford satisfactory results. The reaction is complete in about thirty minutes. The method of simple decolorization affords at least a rough test. Dilutions up to 1–350,000 were estimated with errors of about 5 per cent.

Picrotoxin.—An aqueous solution of picrotoxin, 1–1000, may be estimated with an error of about 1 per cent, and solutions of much lower concentration may be estimated with a slightly greater error. This is the only simple quantitative chemical test for picrotoxin with which we are acquainted.

Salicin.—The reaction requires about thirty minutes; the chloroform method is satisfactory. Apomorphine was not tried.

Salicylic Acid.—The complete reaction requires about 30 minutes, but it is nearly complete within 3 minutes. The chloroform modification permits of an accurate test within 5 or 10 minutes after the addition of HCl; the general method (decolorization) is less satisfactory, but it may be used with a control. Salicylic acid decolorizes $N/10$ bromine solution almost as actively as antipyrine, and with the apomorphine modification it was estimated in a concentration of about 1–900,000. Salicylic acid in concentrated solution forms with bromine a precipitate, which is soluble in chloroform; it does not interfere with the test.

Protocol showing the volume of solution of procaine HCl $N/200$ (1.364 mg. per cc.) which absorbs the bromine in 1 cc. of $N/100$ bromine solution.

Preliminary Test.—In each of two tests the gradual addition of 0.53 cc. $M/200$ Procaine HCl-solution to 1 cc. of $N/100$ bromine and 0.3 cc. 12 per cent HCl caused complete decoloration.

Final Test.—To each of 16 test-tubes there was added 1 cc. of bromine solution $N/100$ and 0.3 cc. of 12 per cent HCl. Successively increasing amounts of Procaine solution $M/200$ were added. Observations were made immediately; after 1 minute; after 10 minutes; at the end of which time chloroform was added; and 5 minutes later a trace of amomorphine was added. The intensity of color in the aqueous layer; in the chloroform; and that induced by apomorphine affords a clew to the amount of unabsorbed bromine. The degree of color is expressed as "xxx" (deep color); "xx;" "x" (barely perceptible color); "—" (no color perceptible).

Procaine	Immed.	1 Min.	10 Min.	Chlor. 10 Min.	Apomorph. 15 Min.
0.3 cc.	xxx	xxx	xxx	xxx	xxx
0.35	xxx	xxx	xxx	xxx	xxx
0.4	xxx	xxx	xxx	xxx	xxx
0.42	xxx	xxx	xxx	xxx	xxx
0.44	xxx	xxx	xxx	xxx	xxx
0.46	—	xx	xx	xx	xxx
0.47				x	xx
0.48	—	x	x	x	xx
0.48				x	xx
0.49				x	xx
0.5	—	—	—	?	x
0.5				?	x
0.51				—	—?
0.52				—	—
0.52	—	—	—	—	—
0.54	—	—	—	—	—

The results indicate that 1 cc. of $N/100$ bromine solution is decolorized by 0.5 cc. Procaine HCl $M/200$, as shown by the chloroform test, and by 0.505 cc. shown by the apomorphine test. Hence 0.682 mg. Procaine HCl absorbs 0.7992 mg. bromine.

SUMMARY.

1. Tenth normal bromine solution (Koppeschaar's solution) was used for the quantitative estimation of a number of alkaloids. Two general modifications of the method are described.

2. By this means quantitative estimations of a number of alkaloids may be made with an error of about 0.5 per cent in concentrations of about 1–1000.

3. The error in the quantitative estimation of substances in solutions of unknown concentration increases with the dilution, but antipyrine, amidopyrine and salicylic acid in concentrations of 1–1,000,000 may be determined with errors of from 5 to 10 per cent.

4. The estimations are made with controls in which attention must be paid to concentration, temperature, rate of reaction and other factors discussed in the paper.

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THE AIR-LIFT EXTRACTOR APPLIED TO THE ANALYSIS OF ALKALOIDAL DRUG EXTRACTS.

BY L. D. SEIF AND T. H. RIDER.

The extraction of alkaloids from pharmaceutical preparations has always been time-consuming and many attempts have been made to accomplish the extraction by means of automatic devices. Most of these have been regarded as unsuitable because they depend upon refluxing of the solvent by heat (1) with a resultant possible decomposition of the alkaloid and because of the difficulty of determining when the extraction is complete (2). The air-lift extractor (3) ac-

complishes the extraction at room temperature, thereby eliminating any error due to heating and it is provided with a stop-cock by means of which samples may be drawn off and tested for completeness of extraction.

In the original articles this extractor was used for the extraction of organic acid and its collection and measurement in standard alkali solution. In the present series of experiments the reverse of this operation is performed, an organic base is extracted and deposited in an acid solution. By this procedure two series of hand shake-outs are eliminated and it is then only necessary to remove the acid solution from the apparatus, make it alkaline with ammonia, proceed with the final extraction in a separatory funnel and titrate or weigh the alkaloid in the usual manner. Ammonia is used in the apparatus in place of caustic alkali because chloroform is not decomposed as readily by ammonia (4) and because in making the solution alkaline with ammonia the analysis more closely parallels the official methods for alkaloidal assays (5). A correction factor is not necessary since the acid solution itself is not titrated but must undergo another extraction before the alkaloid is titrated.

Method.—The large tube of the apparatus (3) is filled nearly to the overflow with chloroform, the preparation to be extracted is superimposed upon it and made alkaline with ammonia. A small quantity of chloroform is placed in the smaller tube, 40 cc. of 5% sulphuric acid is added and then chloroform until the top of the acid layer is almost to the inlet. The air (or nitrogen) is allowed to enter and extraction continued until all of the alkaloid is deposited in the acid layer. This point may be determined by removing a small quantity of chloroform solution through the stop-cock at the bottom of the tube and testing it in the usual manner with Mayer's Reagent. About four hours are required for the complete extraction of the alkaloid. The acid is then removed from the tube, the tube rinsed with water and the final extraction made with chloroform in a separator after making the acid solution alkaline with ammonia.

A series of extractions made by the air-lift extractor and checked by the hand shake-out method of the U. S. P. X shows the two methods to agree within the limits of experimental error (cf. table). The air-lift extractor method requires about one-half the actual working time of the other method although the total elapsed time is somewhat longer.

EXTRACTION OF ALKALOID FROM DRUG EXTRACTS BY THE AIR-LIFT EXTRACTOR AND U. S. P. X METHODS.

Sample.	Air-Lift.	U. S. P. X.
Powd. Ext. Nux Vomica	12.77% alkaloids	12.83% alkaloids
Fluidextract Nux Vomica	(*a*) 2.55 Gm. alkaloids (*b*) 2.17 Gm. per 100 cc.	(*a*) 2.52 Gm. alkaloids (*b*) 2.20 Gm. per 100 cc.
Fluidextract Belladonna	0.363 Gm. per 100 cc.	0.390 Gm. per 100 cc.
Tincture Hyoscyamus	0.00765 Gm. per 100 cc.	0.00788 Gm. per 100 cc.

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THE STABILITY OF DIOTHANE SOLUTION. II.*

BY E. S. COOK, K. BAMBACH AND T. H. RIDER.

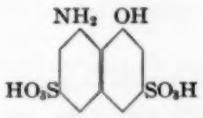
In a previous paper (1) it was reported that prolonged aging or heating of diothane solutions produces a very slight degree of decomposition, yielding a substance containing a primary amino group which may be detected by diazotization and coupling with beta-naphthol. It was pointed out that such a substance could be either an aminobenzoate, formed by rearrangement, or aniline, formed by hydrolysis. A final decision as to the nature of the alteration product was not reached, but it was inferentially shown that its concentration probably did not exceed 1:100,000.

A detailed study of the hydrolysis of diothane by extreme conditions has shown that aniline is, in fact, produced when the hydrolysis is carried out with alcoholic potash. It has been possible to develop a method whereby aniline can be quantitatively recovered. While the details of this experimental work will be published elsewhere, the conclusions are reported in support of the belief that the primary amino compound detected is in all probability aniline.

When diothane solutions are diazotized and coupled with beta-naphthol, as previously reported, the color produced is concentrated upon the precipitate of diothane free base which forms as a result of the alkalinization of the solution. This renders small amounts of color readily detectable but does not make quantitative color comparison easy. The reaction when modified by conducting it in alcohol, in which the free base is soluble, gave a homogeneous color which, however, was not sufficiently intense for colorimetric comparison in the low aniline concentrations encountered.

The standard colorimetric procedure for small amounts of aniline (development of a yellow color with bleaching powder solution) (2) proved to be inapplicable in the presence of diothane. When this reaction was potentiated with phenol (3), the typical blue color appeared but not in sufficient strength for purposes of quantitative comparison.

A diazotization method has been developed using H-acid



instead of beta-naphthol according to the suggestion of Minaev, Svetlyakov and Frolov (4). This reaction was carried out in the presence of alcohol and proved to be of the utmost sensitivity. Concentrations of aniline as low as 1:10,000,000 can be detected qualitatively, which considerably exceeds the 1:500,000 limit claimed by the Russian investigators.

In applying this reaction ten cc. of 1% diothane solution are placed in a test-tube, 0.1 cc. of 0.5*N* HCl is added, the solution is cooled in an ice-bath and 0.1 cc. of a 10% aqueous solution of sodium nitrite is added. The solution is kept cold for 10 minutes and then made alkaline with 0.5 cc. of a 5% aqueous solution of sodium bicarbonate. The precipitate of diothane base is dissolved by the addition of 8 cc. of alcohol and then 0.2 cc. of a fresh 3% solution of H-acid is added. The H-acid solution is made by dissolving 0.75 Gm. of sodium bicarbonate in 50 cc. water and

* From the Research Laboratories of The Wm. S. Merrell Company, Cincinnati, Ohio.

adding 1.5 Gm. of H-acid. Five minutes after the addition of the H-acid solution to the diothane base solution the color is compared with that of a standard aniline solution which has been coupled with H-acid in exactly the same way and at practically the same time.

The standard aniline solution is made by the addition of a known amount of redistilled aniline to a fresh 1% diothane solution. This diothane solution itself should give no color when coupled with H-acid in the manner described above, indicating that it contains no aniline, or at least that the concentration of aniline present is less than the limiting sensitivity of the test.

Lovibond tintometer readings have been taken of all test colors wherever possible, and it was noticed that the color of a given solution deepened upon standing over night. This deepening in color was not detectable for two hours after the test was completed, but sixteen hours or more later was noticeable. The H-acid solution itself darkens with time, and this fact is at least a partial explanation of the darkening of the test colors with age.

RESULTS.

The above procedure has been applied to several 1% diothane solutions which had been aged for varying periods and to others which had been sterilized at 100° C., both with and without the addition of acid, for varying periods of time. The results are summarized in the following tables.

TABLE I.—AGING OF DIOTHANE SOLUTIONS.

Age (Months).	Estimated Aniline Content.
Fresh	Neg. (<1:10,000,000)
7	1:350,000
9	1:200,000
19	1:80,000

TABLE II.—STERILIZATION OF DIOTHANE SOLUTIONS (NO ACID ADDED).

Length of Sterilization (Hours).	Estimated Aniline Content.
1	1:150,000
4½	1:40,000
18½	1:20,000

TABLE III.—STERILIZATION OF DIOTHANE SOLUTIONS (ACID ADDED).

Length of Sterilization (Hours).	Estimated Aniline Content.
1	1:200,000
4½	1:60,000
18½	1:30,000

The solution, the testing of which is reported in Table II, was unacidified and had a p_H of about 5.0. The solutions, the testing of which is reported in Tables I and III, were manufacturer's stock solutions, the p_H of which had been adjusted to 4.5–4.7, during manufacture. It is evident that the addition of excess acid inhibits the development of aniline on sterilization.

The samples which were sterilized for 18½ hours became slightly yellow and the free base, when precipitated, was yellow. There is, of course, no need for such lengthy sterilization in practice, and such discolored solutions would automatically be discarded by the careful user.

It is of interest to estimate the percentage decomposition of the diothane solution which is necessary to produce the amount of aniline actually detected. Assuming that 1 molecule of aniline is developed by the decomposition of 1 molecule of diothane (complete hydrolysis would yield twice this ratio), complete decomposition of a 1% solution of diothane would lead to an aniline concentration of 1

part in 464. This would mean that a concentration of aniline of 1:80,000 as found would represent a decomposition of only 0.6% of the diothane present. Expressed in another way, this would mean that a 1% solution of diothane which had been aged for over $1^1/_2$ years would still contain at least 0.99% of diothane. The sample sterilized for $18^1/_2$ hours still contained over 0.98% of diothane.

This estimation of the maximum amount of diothane which would be decomposed is in harmony with the previously published fact (5) that diothane solutions when sterilized for prolonged periods do not show a perceptible loss in anesthetic activity. We have found that, so long as the diothane solution remains clear and colorless, neither aging nor sterilization affects the local anesthetic potency.

The aging of diothane solutions is being further studied with a view to correlating aniline formation with p_H changes in order more fully to elucidate the nature of the alterations taking place.

SUMMARY.

1. Aging or prolonged heating of diothane solutions produces a very small amount of aniline. The maximum concentration produced by sterilization ($18^1/_2$ hours at 100°) is 1:20,000 in an unacidified solution; in the acidified solution as furnished by the manufacturers the maximum is 1:30,000. Ordinary solutions show a concentration of about 1:350,000. This change is too slight to affect the local anesthetic potency.

2. Addition of acid inhibits the formation of aniline in diothane solution.

3. So long as a diothane solution is clear and colorless its local anesthetic potency is unchanged by aging or sterilization. Solutions which have for *any* reason become cloudy or discolored should not, of course, be used.

4. A very delicate colorimetric method for the estimation of small amounts of aniline has been employed. It is capable of detecting aniline in concentrations of 1:10,000,000.

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HONORING CRAWFORD W. LONG.

The centennial of graduation from University of Georgia by Crawford W. Long, physician-pharmacist, was celebrated in Athens, March 30th. Many references to him may be found in the JOURNAL; among them: 13, 51 (1924); 15, 317 (1926); 17, 517 (1928).

U. S. P. STANDARD FOR DIGITALIS.*

BY F. A. UPSHER SMITH.[1]

The Committee of Revision of the United States Pharmacopœia has under consideration the standard to be adopted for digitalis in the U. S. P. XI, and the best means of ascertaining its strength. The U. S. P. X standard is a minimum systolic dose, by the one-hour method, not exceeding 0.006 cc. of tincture, equivalent to 0.0000005 Gm. of ouabain, for each Gm. of body weight of frog. In Europe there is a strong movement in favor of the adoption of the International Standard Digitalis Powder as the standard for digitalis.

At the Frankfurt Conference it was recommended: "That when the dosage of digitalis or its preparations is expressed in units of activity, the unit employed *for any preparation and in any country* should be an international unit, which should be defined as the specific activity contained in *0.1 Gm. of the international standard powder*."

The International Standard Digitalis Powder has been adopted in the German Pharmacopœia, the French Codex and the British Pharmacopœia (1932). The standard as given for Digitalis Pulverata in the B. P. (1932) is as follows:

"This powder must be assayed by the *biological assay of powdered digitalis*, and its strength must be stated in terms of the *international standard digitalis powder* of which 0.1 Gm. is taken to have an amount of activity described as 1 Unit."

The B. P. gives alternative directions for the assay of digitalis and its preparations, using a frog method or a cat or guinea-pig method.

The International Standard Powder consists of a carefully dried mixture of ten samples of digitalis leaves collected from different sources. The Sub-Committee on Digitalis of the B. P. (*Pharm. J.*, 127, 23 (July 11, 1931)) stated that "it was intended, when the mixture was made, that the potency of the mixture should represent the average potency of digitalis leaves, and records published by the Pharmaceutical Society of Great Britain show this to be the case." (See *Quart. J. Pharm.*, 1, 19 (1928).)

Following the International Protocol, all official tinctures of potent drugs are of 10% strength. If a 10% tincture of digitalis is made from a digitalis of International standard then it will be stronger than one made from U. S. P. digitalis. A comparison was made by Edmunds, Lovell and Braden (JOUR. A. PH. A., 18, 778 (1929)). They concluded that the International Standard Powder was about 30 per cent stronger than the U. S. P. X standard, frogs being used for the assay.

L. W. Rowe (JOUR. A. PH. A., 22, 106 (1934)) finds, by the frog method, that the International Standard tincture is from 20 to 25 per cent more active than the U. S. P. X tincture of digitalis.

J. H. Burn, then head of the Pharmacological Laboratory, Pharmaceutical Society of Great Britain (in the *Quart. J. Pharm.*, 1, 19 (1928)), commented as follows on this question:

"Further, the substitution of the international standard for the present ouabain standard will make no appreciable difference in the United States. In the Pharmaceutical Society's laboratory the lethal dose of tincture prepared from the international standard by the cat method

* Scientific Section, A. PH. A., Washington meeting, 1935.

[1] From the Department of Therapeutic Trials of the Upsher Smith Company.

was found to be 0.76 cc. per Kg., and that of the official U. S. P. ouabain to be 0.06115 mg. per Kg. Hence 1 cc. of the tincture from the international powder was equivalent to 0.0804 mg. ouabain. But the present U. S. P. requirement is that 1 cc. of a tincture shall be equivalent to 0.083 mg. ouabain, so that the international tincture is for practical purposes the same as a tincture fulfilling the U. S. P. definition."

Dr. Burn suggests that the U. S. P. X tincture of digitalis is for practical purposes of the same strength as a tincture made from the International Standard Powder. It seems to me that his conclusion is based on the supposition that the lethal dose of ouabain is the same for the cat as for the frog.

It is apparent, therefore, that U. S. P. digitalis is weaker in strength than the International Standard Digitalis Powder, and consequently, weaker than digitalis official in the British and German Pharmacopœias and the French Codex.

There seems to be no good reason for maintaining the present standard for U. S. P. digitalis, which may be considered as about four-fifths the International Standard. On the contrary, the continuance of the present standard is open to serious objection. It offers a market in the United States for grades of digitalis that do not meet the requirements of leading European markets. In the case of a delicate vegetable drug, like digitalis, depending for its action on glycosides that are sensitive to heat, moisture and air, it is desirable that the collection, desiccation and storage of the drug should be done under such conditions that the glycosides shall be changed in composition as little as possible. If the temperature is too low the drying process is prolonged and the enzymes have a greater opportunity of decomposing the glycosides. A digitalis of low glycosidal content may therefore be contaminated with an undue proportion of decomposition products and these may be obnoxious in their action when taken internally.

Digitalis is one drug in the production of which too great care cannot be taken. The better grades of commercial digitalis are obtainable in which decomposition has been held to a minimum and the biological strength is above that of the U. S. P. X.

In the world of finance it is generally accepted as a fact that "bad money drives out good money." If the standard for digitalis in the United States be continued below that of leading European countries it will result in attracting the lower grades of digitalis to this country.

Standards must, of course, be attainable. In recommending the adoption of the International Standard for digitalis in U. S. P. XI, I am confident that the standard will easily be met. As a grower of digitalis I have frequently produced a dried leaf of twice the activity of the U. S. P. standard. To adopt the International Standard means raising the present standard only about 25 to 30 per cent. One important result of taking this step would be that the tincture of digitalis of U. S. P. XI would be equal in strength to that official in many leading European countries.

A plea for uniformity in the strength of digitalis preparations was made recently in the *J. Am. Med. Assoc.*, 102, 862 (Mar. 17, 1934), in a letter signed by a number of leading cardiologists. If such a plea is valid within a country it is equally so in an international sense, in the interest of travelers. By raising the official standard about 25 to 30 per cent the need for stronger tinctures of digitalis will disappear and a big step will be made toward achieving the desired end—uniformity in strength of the preparations of digitalis. Once this change in strength

was made there would be no further changes to make in the standard for this important drug.

The value of a standard powder in bringing together the results of different workers has been described by this writer (JOUR. A. PH. A., 20, 471 (1931)). Figures are there given showing how reference to the International Standard brought the results of tests on five samples of digitalis leaf made in three different laboratories to a closer agreement.

THE CHOICE OF A BIOLOGICAL TEST.

The biological testing of digitalis has raised questions which bristle with difficult es, and about which there is no unanimity. The Revision Committee, according to Dr. Edmunds (*J. A. M. A.*, 102, 1246–1247 (April 14, 1934)) favors a frog method. It is not my intention to go into details in discussing the relative values of the frog and the cat method. I do want, however, to call attention to the well-known fact that a tincture of digitalis tested on frogs at intervals of three months or more will show a startling loss in strength, whereas the same tincture tested at similar intervals on cats, will only show a slight loss in strength. This was demonstrated by Wokes (*Quart. J. Pharm. & Pharmacology*, 2, 48 (1929), and 3, 205 (1930)). He found that tinctures from thirteen different samples of digitalis leaves, assayed by the frog method, showed a steady loss of activity in all cases. During the first nine months the deterioration proceeded at an average rate of about 3% per month. After that time the rate of deterioration gradually decreased, until about one-third of the activity had disappeared at the end of 16 or 17 months. Assays by the cat method failed to detect any deterioration.

Wokes cites the case of two tinctures A1 and A2, which were assayed when made, and found, in comparison with the International Standard leaves, to be 144 and 148 per cent by the cat method, and 189 and 206 per cent, respectively, by the frog method. They were assayed by the frog method again over a year later and both had lost 46% of their original activity, A1 being now 102 per cent and A2 112 per cent.

By the cat method these tinctures now had a potency of 142 and 148 per cent, respectively, having lost no activity. Had they been diluted to the standard, when made, they would now be 46 per cent below standard, by the frog method, but satisfactory in potency by the cat method. If, however, they had been stored undiluted, the cat method would show them much too potent, but the frog method would show them both to be of correct potency. This illustrates a pitfall in assaying old digitalis tinctures.

Foster and van Dyke (JOUR. A. PH. A., 22, 381 (1933)) studied the effect of aging upon the potency of digitalis tinctures, assays being made on the cat and frog. Aged tinctures were found to be less potent by assay in both species; however, the greater reduction in potency was usually observed in the frog. The frog method makes it exceedingly difficult, if not impossible, for a manufacturer to guarantee the strength of tincture of digitalis, even for 3 months. If the frog method be used at the time of manufacture, and the tincture adjusted to the U. S. P. X standard, a check up 3 months later will show a greatly diminished strength. This renders the manufacturer vulnerable to attack by the Pure Food and Drugs authorities, who are obliged to take the U. S. P. for their guide.

Dr. Edmunds stated (in the letter referred to) that no manufacturer had advocated the cat method. By this I presume Dr. Edmunds means "no manufacturer on the Committee of Revision." Outside of that body there are manufacturers who have used the cat method, and are still using it, in the belief that they are on safer ground. The cat method has the further advantage that it affords a means of calculating the physiological dose for a patient, by dividing the patient's body weight by 10 and giving that number of cat units in divided doses.

The adoption of the International Standard for digitalis in U. S. P. XI, and the recognition of 100 mg. of this powder as an International Unit, using cats for determining the strength, would provide the physicians with products whose dose would be easily calculated by the method of Eggleston. Instead of taking one-tenth the body weight in pounds, as in using cat units, the physician would take *one-twelfth* the patient's body weight in pounds and give that number of International Units, in divided doses.

We have had practical experience of the use of a standard powder for over three years, and are well satisfied that by adopting it we were able to maintain uniformity of strength with greater certainty than without a standard powder.

A national Standard Digitalis Powder for the United States would preferably be prepared from a mixture of powdered leaves from different sources. It would not be necessary to adjust the strength of such a U. S. P. standard powder so as to make it equivalent, weight for weight, to the International Standard, but the ratio between the potencies of the two standard powders could be determined in a series of tests, one series with frogs, and another with cats.

The adoption by the U. S. P. of the International Unit as a standard for digitalis products would be a simple matter. The unit of digitalis would be defined as the amount of activity contained in 0.1 Gm. of the International Standard Digitalis Powder, so that 1 Gm. of the International Standard represents 10 units.

The British Standard Digitalis Powder tested by different workers showed an average potency, with frogs of 138% of the International Standard or 13.8 units per Gm., so that 1 unit is contained in 0.0725 Gm. of the British Standard Powder. When the comparison was made by means of cats the activity was found to be 116% of the International Standard, or 11.6 units per Gm., so that 1 unit is contained in 0.0862 Gm. of the British Standard Powder.

Whether a cat or frog method (or both) is adopted in the U. S. P. XI there will, therefore, be no difficulty in arriving at a satisfactory standard digitalis powder for use in the United States.

Paraphrasing the well-known axiom of homeopathy, there seems to be a unanimity of opinion among pharmacologists that, in the selection of standards, "similia similibus æstimantur" is a safe guide.

TWELFTH INTERNATIONAL CONGRESS OF PHARMACY.

The Twelfth International Congress of Pharmacy, as heretofore mentioned, will convene in Brussels, July 30th to August 6th, under the patronage of His Majesty Leopold III, organized under the auspices of the International Pharmaceutical Federation, the National Pharmacy of Belgium, the Pharmaceutical Society of Anders.

Members attending the Congress will have a free admission to the World's Fair being held at that time and reduction rates on railroads. The opening session will be held in the Hall of Fame of the University of Brussels. The banquet will take place on August 2nd.

STUDIES ON THE BIOASSAY OF DIGITALIS.*[1]

II. NEW LEG-VEIN AND INTRAMUSCULAR GUINEA-PIG METHODS.

BY JAMES H. DEFANDORF.

Guinea-pig, cat and frog methods for the assay of digitalis are optional in the recent British Pharmacopœia (1). In the United States the one-hour frog method is official (15) and the intravenous cat method (7) is highly recommended by various investigators (6, 8, 13), while the use of the guinea pig for this purpose is rather limited.

The practical value of the guinea pig in toxicological tests seemed to warrant further investigations with this animal in the assay of digitalis. New leg-vein and intramuscular minimum lethal dose methods with simplified technique were devised and checked against the subcutaneous guinea-pig method of Reed and Vanderkleed (10), the U. S. P. X one-hour frog method (15), the modified four-hour U. S. P. X frog method (4), the intravenous frog method of Smith and McClosky (14), and the intramuscular frog method of Dooley and Higley (5). Since some uncertainty seemed to exist as to whether the death of this animal following digitalis intoxication was primarily of cardiac or respiratory origin, this subject also was investigated by observing the relative occurrence of cardiac and respiratory failure.

METHODS.

The Subcutaneous Guinea-Pig Method (10).—Tincture of digitalis, rendered alcohol free by evaporation and diluted with water, is injected subcutaneously in the abdominal region of guinea pigs weighing about 240 Gm., and the minimum lethal dose determined, which is the smallest amount injected causing death within a period of two hours.

The New Leg-Vein Guinea-Pig Method.—Guinea pigs ranging in weight from 250 to 350 Gm. were used. All alcohol was removed from the tincture by evaporation, and the residue diluted with physiological saline to make preparations varying from 3 to 5 per cent in strength, so that the amount of fluid injected ranged from 1 to 2 cc., depending on the dose and size of the animal. The guinea pig was then securely tied, abdomen downward, to the special animal board, and the large superficial vein on the dorsal and inner aspect of the hind leg was exposed according to the procedure of Roth (12). The preparation was then slowly injected at the rate of 1 cc. per minute in order to avoid toxic effects due to concentration of the drug. The symptoms were noted and the time of death recorded, the minimum lethal dose being the smallest amount injected causing death within two hours, in over half the animals.

The New Intramuscular Guinea-Pig Method.—Guinea pigs ranging in weight from 250 to 350 Gm. were used. All alcohol was removed from the tincture by evaporation, and replaced with physiological saline, so that the preparation retained its original drug strength. Dilutions were not made in order to avoid the injection of too large an amount of fluid. The dose was injected in equal amounts into the posterior muscles of each thigh. The minimum lethal dose is the smallest amount injected which caused death within two hours, in over half the animals.

The U. S. P. X Frog Method (15).—This is the official method of the United States Pharmacopœia.

The Modified U. S. P. Four-Hour Frog Method (4).—This method differs from the U. S. P. X method only in that four hours instead of one hour are allowed for the absorption and action of the drug.

The Intravenous Frog Method of Smith and McClosky (14).—The minimum systolic standstill dose is determined one hour following the injection of digitalis into the abdominal vein of the decerebrated frog.

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* Scientific Section, A. PH. A., continued from Madison meeting, A. PH. A., 1933.

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The Intramuscular Frog Method of Dooley and Higley (*5*).—The dose of digitalis is injected in equal amounts into the thigh muscles of the frog. The minimum systolic dose is the smallest amount injected causing systolic standstill in one hour.

EXPERIMENTAL PROCEDURES.

Four tinctures of digitalis, designated as "B," "C," "D" and "Dx," were examined. All except "Dx" were defatted tinctures made according to U. S. P. X directions. "B" was made from Gilpin "M" leaves, "C" and "D" from McIlvaine leaves, while "Dx" was made from "D" by dilution, the degree of dilution being unknown to the author until all assays were completed.

In the guinea-pig tests male and female animals weighing from 250 to 350 Gm. were used. They were kept in the animal building at room temperature and fed on a well-balanced ration consisting of a brand of prepared food known as Purina Rabbit Chow, and water, this diet occasionally being supplemented with hay and green leafy vegetables.

Food was withheld from the guinea pigs the night before the experiments and the animals were weighed to within one Gm. immediately preceding the test. Doses were calculated on the basis of these weights. The alcohol-free preparations were not filtered before injection. Death occurring within two hours as the result of respiratory failure was taken as the end-point. Re-injected guinea pigs were not included in the results, as they invariably lost weight and were in poor condition for many days following the first injection, contrary to the observations of Vanderkleed and Pittenger (16).

The following is a typical protocol of the course of events in the new leg-vein method, the symptoms described being identical with those of the subcutaneous and new intramuscular methods, except for their slightly earlier appearance as the result of this method of administration:

Guinea pig, male, weight 326 Gm.
Tincture "B:" Evaporated 15 cc. to 3 cc., and diluted residue with physiological saline to make a 5 per cent solution (1 cc. = 50 mg.).

11:20–11:22	Injected 1.3 cc. of above preparation (= 0.2 of a mg. per Gm.) into leg vein at the rate of 1 cc. per minute.
11:30	Grinding of teeth, retching attempts (nausea).
11:35	Violent trembling, retching and salivation, slow labored respiration.
11:40	Gasping, clonic convulsions.
11:42	Violent convulsions; animal falls on side, exhausted from respiratory distress.
11:45	Animal remains lying on side in comatose condition; respiration very slow and labored.
11:48	Respiration stopped.
11:50	Heart still beating.
11:55	Chest opened and heart observed; auricles contracting efficiently but slowly; ventricles contracting efficiently but very slowly (36 per minute).
12:00	Ventricles stopped; auricles beating slowly.
1:00	Auricles still beating.
1:30	Auricles stopped.

The results shown in Table I are typical, representing numerous similar observations in all three guinea-pig methods, and indicate that respiratory failure is the primary cause of death. After respiration has stopped the ventricles continue to beat in an efficient manner at a slowed rate, and may continue to do so for several minutes.

TABLE I.—OCCURRENCE OF RESPIRATORY AND CARDIAC FAILURE IN GUINEA PIGS FOLLOWING DIGITALIS INJECTION. (TINCTURE "C.")

Animal Number.	How Injected.	Time to Respiratory Failure, Minutes.	Time to Ventricle, Minutes.	Time to Cardiac Failure. Auricle.	Time between Respiratory and Ventricular Failure, Minutes.	Time between Respiratory and Auricular Failure.	Dose in Mg. per Gm.
4-P	Subcut.	103	106	Not observed	3	Not observed	0.25
5-B	"	30	102	" "	72	" "	0.3
6-I	"	96	143	" "	47	" "	0.3
6-J	"	119	139	" "	20	" "	0.3
6-K	"	96	113	" "	17	" "	0.3
6-L	Intrav.	29	34	" "	5	" "	0.175
6-H	Subcut.	101	110	" "	9	" "	0.3
6-M	"	85	93	" "	8	" "	0.3
6-N	"	67	77	252 min.	10	185 min.	0.35
6-P	"	81	108	251 "	27	170 "	0.35
6-R	"	79	98	249 "	19	170 "	0.35

At this time it should be mentioned that out of 281 guinea pigs injected, using various doses of three tinctures and three methods of assay, 155 animals died within two hours, and only 10 of the surviving 126 died within twenty-four hours. It is therefore apparent that the two hours' limit is entirely satisfactory from a practical standpoint.

TABLE II.—SUMMARY SHOWING RESULTS OF GUINEA PIG AND FROG ASSAYS OF TINCTURES "B," "C," "D" AND "DX."

Tincture.	Guinea-Pig Methods.			Frog Methods.			
	Subcutaneous.	New Leg Vein.	New Intramuscular.	One-Hour U. S. P. X.	Four-Hour Modified U. S. P. X.	Intramuscular (Dooley-Higley).	Intravenous (Smith-McClosky).
	Minimum Lethal Dose in Mg. per Gm.			Minimum Systolic Standstill Dose in Mg. per Gm.			
"B"	0.25	0.175	.....	0.8	0.8	0.8	0.4
"C"	0.3	0.2	.....	...	...	...	...
"D"	0.3	0.2	0.225	0.7	0.8	0.8	0.4
"Dx"	....	.....	0.4	0.9	...	...	...

Table II is a brief summary of the minimum lethal and minimum systolic standstill doses obtained on four tinctures by guinea-pig and frog methods, respectively. The number of animals used in the guinea-pig assays ranged from 17 to 48 per assay method, depending on the number needed to obtain clear-cut results, and the number of animals from which the minimum lethal dose itself was determined never was less than 5, and never more than 12.

Tincture "C" was exhausted before it could be assayed on frogs, so that it affords a comparison only of the subcutaneous and leg-vein guinea-pig methods.

Since tincture "Dx" was a preparation of unknown strength made from tincture "D" by dilution, prepared particularly for further investigation of the new intramuscular guinea-pig method first used in the assay of tincture "D," the guinea-pig results were only checked against the official U. S. P. X one-hour frog method.

Analysis of this table shows that the minimum lethal dose in the leg-vein method is smaller than that in the subcutaneous method, and in the one case where comparison is possible (tincture "D") the intramuscular minimum lethal dose falls between the leg vein and the subcutaneous minimum lethal doses.

While three of the four methods indicate that tinctures "B" and "D" are of identical strength, the two guinea-pig methods indicate that tincture "B" is approximately 15 per ceat stronger than "D." These results in themselves are insufficient for the purpose of determining which animal gave the better picture of the relative strengths of the two tinctures.

An interesting comparison of the intramuscular guinea-pig and the U. S. P. X frog methods is furnished in the assay of tinctures "D" and "Dx." According to the new intramuscular guinea-

pig assay tincture "Dx" is 56.3 per cent of the strength of tincture "D," while by the U. S. P. X frog assay "Dx" is 77.7 per cent of the strength of "D." As tincture "Dx" was made by adding two parts of the menstruum to three parts of tincture "D," the former preparation was actually 60 per cent of the strength of tincture "D." It is thus apparent that the intramuscular guinea-pig method gave a much more accurate evaluation than did the official U. S. P. X frog method.

DISCUSSION.

The administration of lethal amounts of digitalis to the guinea pig causes death apparently by its toxic action on the respiration (protocol and Table I). In the case of observations on many other animals, the results of which are not included in Table I, the heart beats could be felt through the chest wall for some time after respiration had stopped.

The question arises as to whether the conclusion of Richaud (11) is sound, that is, whether respiratory failure renders valueless the guinea pig as an assay animal for digitalis, a drug mainly used for its effect on the heart. One of the principles of bioassay which Dale (3) and Burn (2) emphasize is that a test does not have to be identical with therapeutic effect as long as it measures the important active principle. Comparison of the results obtained by four frog and three guinea-pig methods of assay on digitalis, in which artificial respiration was not employed, show a fairly close agreement, the advantage lying slightly on the side of the guinea-pig method. It seems logical to conclude from these results that lethal dose guinea-pig methods, in which death is primarily due to respiratory failure, are reliable measures of the activity of digitalis, when compared with frog heart methods.

The subcutaneous, new leg-vein and new intramuscular guinea-pig methods possess advantages over the intravenous methods of Knaffl-Lenz (9) and that of the recent British Pharmacopœia in that anesthesia is unnecessary, artificial respiration is not employed, and the operative procedure is less severe; as a result they are less time consuming and larger numbers of animals can be used in a given length of time, with a resultant decrease in experimental error.

Preference in the three guinea-pig methods is therefore not dependent on relative bioassay value, as all apparently give satisfactory results, but upon utility as to time and technique. The subcutaneous and new intramuscular methods are very simple and can be quickly performed. The new leg-vein method is more time consuming. The investigations with the new intramuscular method indicate that this method may prove to be of greater practical value in the assay of digitalis than the other methods.

SUMMARY AND CONCLUSIONS.

Male and female guinea pigs varying in weight from 250 to 350 Gm. showed no apparent differences in susceptibility to digitalis.

Guinea pigs once injected with digitalis should not be used again in assaying this drug, except in preliminary tests, as these animals lose weight and often remain in poor condition for many days following its administration.

Evidence is presented which indicates that respiratory failure is the primary cause of death following the parenteral administration of digitalis to guinea pigs.

The subcutaneous, new leg-vein and new intramuscular guinea-pig minimum lethal dose methods compare favorably with the frog heart method for the bioassay of digitalis.

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A COMPARATIVE STUDY OF THE ABSORBABILITY OF SIX CALCIUM COMPOUNDS.*[1]

BY A. RICHARD BLISS, JR., AND ROBERT W. MORRISON.

INTRODUCTION.

Two preliminary reports of this investigation have been published (1, 2). This paper reports the findings of the completed study, and covers the relatively wide gaps (0.25 mg.) between the quantities of Magnesium Sulphate required to completely neutralize the absorbed Calcium, presented in the previous papers, as well as time intervals above and below the time factor (2 hours) used in the earlier investigations.

The first study concerned itself with Dicalcium Phosphate, Calcium Chloride, Lactate, Glycerophosphate, Gluconate and Hexacalcium Inosite Hexaphosphate. These six calcium compounds and Calcium Lacto-phospho-gluconate were the agents investigated in the second study. The first six calcium combinations were employed in the final investigation.

Since a review of the literature related to these investigations has been included in the reports already published, space will be conserved by omitting the review in this final paper.

THE METHOD.

The technique (6) employed in the final study was the same as that used before, and is based on the antagonism between magnesium and calcium, earlier experiments having shown that animals narcotized by magnesium are awakened by injections of calcium salts, and, conversely, animals which have absorbed increasing quantities of calcium require greater amounts of magnesium for narcosis. Pure-bred albino mice were used. The calcium preparations were administered by stomach tube, and, after time intervals ranging from 30 minutes to 9 hours, magnesium sulphate was injected subcutaneously. Controls were run at the same time.

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* Scientific Section, A. Ph. A., Washington meeting, 1935.

[1] From The Reelfoot Lake Biological Station, Reelfoot Lake, Tennessee.

The mice received no water or food for from 12 to 15 hours before the ingestion of the calcium preparations. From 3 to 10 per cent aqueous solutions or suspensions of the calcium compounds were used. The magnesium sulphate was injected in the form of a 10 per cent aqueous solution. The index was the production of a definite degree of narcosis which presents itself with effective doses in from about 12 to 20 minutes after the injection of the magnesium sulphate solution. The required degree of narcosis was the point at which the mice lie on their backs without movement or attempts to turn over.

Extensive preliminary experiments demonstrated that 0.9 mg. of magnesium sulphate ($MgSO_4.7H_2O$) per Gm. of body weight is just adequate for the production of the required state of narcosis in albino mice. If some of the ingested calcium was absorbed, then a greater amount of magnesium sulphate is required to produce narcosis than is the case where no calcium is administered or absorbed. The amounts of each calcium compound administered in mg. per Gm. of body weight is equivalent to 0.3 mg. of calcium per Gm. of body weight. The tables following are self-explanatory.

Table I presents a summary of the results obtained in the studies already published.

TABLE I.—SUMMARY OF PRELIMINARY STUDIES.

Calcium Salt.	Amt. $MgSO_4.7H_2O$ Required for Partial Narcosis (Mg. per Gm.).	Amount $MgSO_4.7H_2O$ Required for Complete Narcosis (Mg. per Gm.).
Calcium chloride	1.25 (3 out of 3)	
		1.50 (3 out of 3)
Calcium lactate	1.00 (1 " " 3)	
	1.25 (3 " " 3)	
	1.50 (1 " " 3)	1.50 (2 " " 3)
		2.00 (3 " " 3)
Calcium gluconate	1.00 (3 " " 3)	
	1.25 (3 " " 3)	
	1.50 (1 " " 3)	1.50 (2 " " 3)
		2.00 (3 " " 3)
Dicalcium phosphate	1.00 (3 " " 3)	
	1.25 (1 " " 3)	1.25 (2 " " 3)
		1.50 (3 " " 3)
Calcium glycerophosphate	0.90 (2 " " 3)	
	1.00 (1 " " 3)	1.00 (2 " " 3)
		1.25 (3 " " 3)
		1.50 (3 " " 3)
Hexacalcium inosite hexaphosphate	1.00 (5 " " 5)	
	1.25 (4 " " 7)	1.25 (3 " " 7)
		1.50 (6 " " 6)

Since 0.9 mg. per Gm. of body weight is the minimum amount of magnesium sulphate ($MgSO_4.7H_2O$) required to produce the desired state of narcosis in albino mice which have received no water or food for from 12 to 15 hours, by subtracting 0.9 from the magnesium sulphate values given in the tables, the amounts of magnesium sulphate required to counteract the absorbed calcium are obtained; the larger the quantity of magnesium sulphate required for complete narcosis, the greater the amount of absorbed calcium.

Magnesium sulphate was administered in ascending doses of 0.25 mg. per Gm. in the preliminary studies. In the final investigation the dose was stepped up in 0.05 mg. per Gm. quantities so as to determine more closely and accurately the critical points. With each series determinations were made at 30-minute, 1-, 2-, 3-, 4-, 5-, 6-, 7-, 8- and 9-hour intervals after the administration of the calcium preparations. Each mouse was used for but one experiment.

One series of tables will suffice to show how the final studies were made and recorded. Tables II through IX give the results obtained with calcium chloride.

TABLE II.—CALCIUM CHLORIDE.

$MgSO_4$ injected 30 minutes after calcium ingestion.

Animal No.	Wt. (Gm.) of Mouse.	Dose of $CaCl_2$ (Mg. Ca per Gm. Body Wt.).	Dose $MgSO_4$ (Mg. per Gm. Body Wt.).	Minutes to Narcosis.
400	22.25	0.3	1.15	Partial, 20
401	12.20	"	"	" 22
402	13.64	"	"	" 17
403	19.55	"	1.20	" 22
404	24.48	"	"	" 20
405	20.19	"	"	Complete, 17
406	18.91	"	1.25	" 8
407	23.72	"	"	" 21
408	20.51	"	"	" 20

TABLE III.—CALCIUM CHLORIDE.

$MgSO_4$ injected 1 hour after calcium ingestion.

409	21.00	0.3	1.20	Partial, 23
410	12.22	"	"	" 21
411	21.77	"	"	" 20
412	25.55	"	1.25	" 25
413	20.20	"	"	" 24
414	25.12	"	"	" 20
415	20.37	"	1.30	Complete, 20
416	20.00	"	"	Partial, 12
417	12.80	"	"	Complete, 12
418	18.65	"	1.35	" 12
419	19.25	"	"	" 20
420	23.94	"	"	" 22

TABLE IV.—CALCIUM CHLORIDE.

$MgSO_4$ injected 2 hours after calcium ingestion.

421	15.77	0.3	1.25	Partial, 14
422	20.46	"	"	" 17
423	13.34	"	"	" 17
424	24.86	"	1.30	" 17
425	20.16	"	"	" 15
426	16.63	"	"	Complete, 14
427	24.61	"	1.35	Partial, 19
428	19.95	"	"	Complete, 17
429	15.32	"	"	" 10
430	20.00	"	1.40	" 8
431	15.30	"	"	" 5
432	27.20	"	"	" 12

TABLE V.—CALCIUM CHLORIDE.

$MgSO_4$ injected 3 hours after calcium ingestion.

433	20.00	0.3	1.25	Partial, 15
434	17.00	"	"	" 23
435	20.00	"	"	Complete, 11
436	17.00	"	1.30	Partial, 19
437	16.00	"	"	" 20
438	15.00	"	"	Complete, 9

439	13.56	"	1.35	Partial,	16
440	18.51	"	"	Complete,	10
441	21.09	"	"	"	7
442	20.32	"	1.40	"	10
				(Died, 15 min.)	
443	20.54	"	"	Complete,	10
444	20.41	"	"	"	8
				(Died, 16 min.)	

TABLE VI.—CALCIUM CHLORIDE.

$MgSO_4$ injected 4 hours after calcium ingestion.

445	21.83	0.3	1.30	Partial,	19
446	17.91	"	"	"	18
447	22.05	"	"	"	16
448	21.12	"	1.35	"	17
449	12.65	"	"	"	16
450	24.31	"	"	"	20
451	18.03	"	1.40	"	20
452	13.85	"	"	"	16
453	18.20	"	"	Complete,	8
454	16.79	"	1.45	"	14
455	21.23	"	"	"	20
456	22.36	"	"	"	13

TABLE VII.—CALCIUM CHLORIDE.

$MgSO_4$ injected 5 hours after calcium ingestion.

457	19.45	0.3	1.35	Partial,	16
458	15.32	"	"	"	17
459	19.87	"	"	"	17
460	27.85	"	1.40	Complete,	14
461	23.36	"	"	Partial,	16
462	17.41	"	"	"	19
463	15.30	"	1.45	"	19
464	18.45	"	"	Complete,	17
465	21.33	"	"	"	19
466	18.76	"	1.50	"	12
467	20.12	"	"	"	10
				(Died)	
468	14.85	"	"	Complete,	13

TABLE VIII.—CALCIUM CHLORIDE.

$MgSO_4$ injected 6 hours after calcium ingestion.

469	19.86	0.3	1.35	Partial,	21
470	19.23	"	"	"	14
471	24.76	"	"	"	18
472	27.54	"	1.40	"	16
473	22.27	"	"	Complete,	13
474	22.39	"	"	"	13
475	20.45	"	1.45	"	17
476	24.32	"	"	"	18
477	23.66	"	"	"	20

TABLE IX.—CALCIUM CHLORIDE.

$MgSO_4$ injected 7 hours after calcium ingestion.

478	17.50	0.3	1.30	Complete,	15
479	20.88	"	"	Partial,	15
480	21.75	"	"	"	13
481	18.45	"	1.35	Complete,	13
482	16.59	"	"	"	13
483	24.67	"	"	"	11

At the end of the 7th and 8th hours further uniform decreases in amounts of Magnesium Sulphate required for narcosis were observed. Table X summarizes the results obtained in the entire investigations through the seventh hour.

TABLE X.—SUMMARY OF COMPLETED STUDIES.

Magnesium sulphate required for complete narcosis at various intervals.

Drug.	30 Min.	1 Hr.	2 Hrs.	3 Hrs.	4 Hrs.	5 Hrs.	6 Hrs.	7 Hrs.
Calcium chloride	1.25	1.35	1.40	1.40	1.45	*1.50*	1.45	1.35
Calcium lactate	1.40	1.55	1.55	1.60	*1.65*	*1.65*	1.55	1.40
Calcium gluconate	1.30	1.30	1.35	1.45	*1.55*	1.50	1.45	1.40
Dicalcium phosphate	1.15	1.25	1.35	1.40	*1.45*	1.40	1.35	1.30
Calcium glycerophosphate	0.95	1.05	1.10	1.15	*1.25*	*1.25*	1.20	1.05
Hexacalcium inosite hexaphosphate	1.20	1.25	1.30	1.35	*1.45*	*1.45*	1.40	1.35

DISCUSSION.

The results obtained show that there is a fair degree of variation in the absorbability of the six calcium compounds studied. When arranged according to the maximum amount absorbed, they place themselves in the following order:

1. Calcium lactate.
2. Calcium gluconate.
3. Calcium chloride.
4. { Hexacalcium inosite hexaphosphate. / Dicalcium phosphate.
5. Calcium glycerophosphate.

With each compound there is a constant rise in the calcium absorbed until the fourth hour when a maximum absorption is reached for all of the calcium compounds studied excepting calcium chloride which requires five hours. The larger quantities of calcium are absorbed during the third, fourth, fifth and sixth hours after administration. The fall begins in the sixth hour.

It is interesting to note that the calcium-lactic acid combination heads the list. These observations are in agreement with the findings of McGowan and Bergheim. McGowan (3) demonstrated with rabbits that the most important single factor influencing the absorption of calcium and phosphorus seems to be the acidity of the gastric contents. Bergheim (4) has pointed out the significant influence the lactic acid radical has on the absorption of calcium, and suggested that the much higher proportion of lactose to calcium and phosphorus in human as compared with cow's milk may be a factor in the higher degree of utilization of the calcium content of the former. He attributes the fact to the production of a distinctly acid condition throughout the gastro-intestinal tract, due to increased lactic

acid formation in the intestine, Rowe and Kahn (5) having shown that the alkaline intestinal and pancreatic secretions and bile exert an inhibitory influence on the rate of calcium absorption.

It is obvious that of the six calcium compounds studied, in albino mice, calcium lactate is the most rapidly and effectively absorbed calcium compound for oral administration. It is reasonable to assume that the same may hold in human subjects.

The authors are indebted to Miss Jessie May Gill for valuable assistance during these studies in which over 900 albino mice were used.

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DRUGS AND BUGS.*

BY ERNST T. STUHR.[1]

The elemental forces which destroy and devour natural resources have long been interesting and fascinating to the curious mind. As the visible forces, such as floods, storms, famines and diseases, destroy progress in civilization, so too, are unnoticed destructive forces. Insects have long been known to be the most destructive of animals. Stored vegetable and animal products are subject to constant menace of invasion by parasites unless proper storing facilities and preventive precautions are observed.

The stock-room of the drug store is, in some instances, a disorderly, neglected and mistreated department of the store. If this is the case, a very untidy situation and atmosphere results, creating a haven for pest invasion of all kinds, including rodents (rats and mice), which are often carriers of bacteria and disease germs.

In general, drugs possessing an abundance of starch, inulin and sugars are most liable to the attack of pests. It should be kept in mind, however, that even in products not infested there is a gradual deterioration which in time renders many products unfit for use. Sanitary storage as a preventive measure is of importance in retarding deterioration.

Every retailer and wholesaler should be vitally interested and should profit by acquiring knowledge of the appearance and habits of the enemies which are harmful and detrimental to drugs in general. An acquaintance with the insect kingdom, as to harmful insect pests, their life cycles and habits and some of the possible preventive and combative means or methods, is essential. The ento-

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* Scientific Section, A. PH. A., Washington meeting, 1934.

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mological knowledge of the pharmacist need not necessarily be exhaustive, therefore, a synopsis of the extensive class of insects, more numerous in species than all other animals combined, is sufficient.

PHARMACO-ENTOMOLOGICAL DISTINCTION OF INSECTS.[1]

Insects in the adult stage possess well-developed mouth parts. A simple classification or two-group division of insects will be considered according to mouth parts.

A. Mouth parts fitted for chewing.
B. Mouth parts fitted for sucking.

The pharmacist should be interested for the most part in the so-called "biting insects." The "sucking insects" have little opportunity to destroy materials commonly stocked in the drug store, which consists primarily of dry package materials. Certain of the so-called "sucking insects," however, cannot be ignored. Certain young insects have been provided by nature with jaws for biting, which later develop into sucking insects, *e. g.*, certain caterpillars (later become moths or butterflies).

Fig. 1.

Fig. 2.

Fig. 1.—*Sitodrepa panicea* L. (Fam. Anobiidæ) (after Chittenden, U. S. Dept. Agr.).

Fig. 2.—*Silvanus gemellatus* Duv. (Fam. Cucujidæ) (after Chittenden, U. S. Dept. Agr.).

During the past six years extended observations have been conducted on infested stocks with studies of causes of conditions and various possible means of combat for eradication of pests. Monthly, seasonal and yearly checks have been kept, primarily on the so-called "animal parasites" or insects, with enlightening results.

In this paper some of the pests commonly detrimental to stocks and some simple methods found useful in eradicating them are outlined. A list of the more susceptible drugs which are injured by common pests should be most worthy of consideration.

DESTRUCTIVE BEETLES INFESTING CRUDE DRUG STOCK.[2]

Fig. 1. *The Drug Store Beetle.*—A reddish brown insect, 2.4 to 2.7 mm. in length and covered with a short dense pubescence. It is cosmopolitan, being found in homes, stores, warehouses, etc. This beetle infests nearly all sorts of dried plant and animal matter. The eggs are laid on the food, the larvæ working in. Pupation is within a cocoon, and the life cycle is completed in less than two months. Control is by fumigating or by heating to 49° C. Carbon disulphide is the recommended fumigant for grains.

Fig. 2. *The Square-Necked Grain Beetle.*—A reddish brown insect of about 2.5 to 3 mm. in length. This beetle is more abundant in warmer climates, but may be found in heated buildings and warehouses. It eats out the germs of the seed in which it develops. The life cycle is completed in about three weeks. Control as recommended by the U. S. D. A. for grain beetles is similar to that for the drug store beetle.

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[1] Sayre, "Organic Materia Medica and Pharmacognosy."

[2] The author is indebted to members of the staff of the Department of Entomology for the identification of the respective beetles.

CRUDE DRUG STOCK FOUND INFESTED.

(*a*) *Infested by the Drug Store Beetle:*

Angelica (rhizome and roots)
Aralia (rhizome and roots)
Asclepias (root)
Aspidium (rhizomes and stipes)
Bryonia (root)
Cichorium (root)
Colchicum (corm)
[1] Euonymus (root-bark)
Glycyrrhiza (rhizome and roots)
Kola (cotyledon)
Lappa (root)
Stillingia (root).

(*b*) *Infested by the Square-Necked Grain Beetle:*

Amygdala Amara (kernel)
Belladonna (root)
Berberis (rhizome and roots)
Calumba (root)
Iris (peeled rhizome)
[1]Iris versicolor (rhizome)
Kava (rhizome and roots)
Rheum (rhizomes and roots)
Sumbul (rhizome and roots)
Zingiber (rhizome).

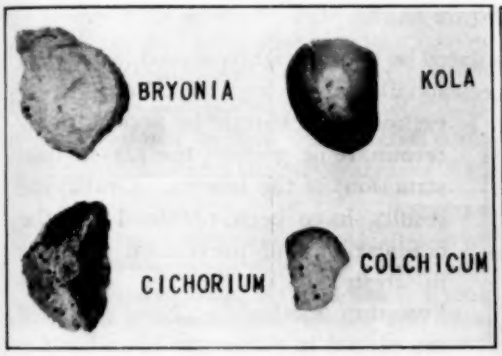

Fig. 3.—Crude drug stock found infested by drug store beetle.

Fig. 4.—Crude drug stock found infested by square-necked grain beetle.

MEASURES FOR DETECTION, PRESERVATION AND EXTERMINATION.

I. Detective Suggestions.—a. Inspection of stock-room, cellars, counters, packages, shelves, containers, laboratories and boxes is essential.

b. Evidences of pest presence: indicated by much powder and broken pieces or bits in bottom of stock containers.

c. Determination of classification of pest—whether beetle, moth, fly, mold, rust, etc. Knowing nature of the pest will assist in determining the proper remedy for effective extermination.

II. Preventive Suggestions.[2]*—a.* Observe sanitation and cleanliness (insect parasites indicate filth).

b. Store only pest-free products.

c. Keep vegetable and animal drugs in a dry, cool atmosphere (preferably in air-tight containers, rooms or bins).

d. Maintain ideal storing temperature—25° C. (77° F.).

III. Combative Suggestions.—Effective methods of extermination.

a. For eggs, larvæ and insects:[3] Expose to temperature of 60° to 65° C. (140° to 149° F.) for about fifteen minutes in case of small amounts of products. For larger quantities of materials the temperature exposures should be from two to three days. Scald and thoroughly dry containers. *Caution:* High temperature with *volatile drugs* is reputed detrimental.

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[1] Infested with both insects.

[2] Dunn, "Insect Friends and Foes," *Am. J. Pharm.*, 104 (October 1932).

[3] Youngken, "Textbook of Pharmacognosy."

b. For insect-infested products.[1] Use of fumigants. Add several drops of carbon tetrachloride or chloroform (about 25 cc. for each 100 cubic feet of drug). Two treatments are advisable, a week or two apart. Either of the above insecticides or preservatives are essential and effective against destruction. Camphor applications are reputed to be useful in the preservation of dried animal drugs.

IV. Requirements of Ideal Pest Exterminators.[2]—*a.* Must arrest growth or destroy parasite.

b. Must be more toxic to pest than host.

c. Must be adherent and maintain activating properties for a certain period of time.

d. Must enter into intimate contact with the parasites or their elements.

V. Vegetable or Mold Parasites[3] (*Spore-Producing Pests*).—Bacteria, fungi, lichens, molds, rusts, mildews and smuts produce fungus diseases. Infest drug stocks exposed to warm, dark, damp atmospheres. This group of pests is thought to deteriorate and decompose the active constituents of products. Moldy drugs result when stocks are stored in damp atmosphere. To prevent destruction keep in dry state.

SUGGESTIONS AND PRECAUTIONS TO BE OBSERVED FOR THE PROPER STORING OF THE FOLLOWING CRUDE DRUGS.

It is recommended that the drugs tabulated be kept in tightly closed (air-tight) containers, and if found to be infested, occasionally a few drops of chloroform or carbon tetrachloride be added to exterminate or prevent the attack (destruction) of the insects. Gratifying results have been obtained for the eradication and prevention of pests in fresh stocks by the so-called "vacuum method." New supplies are placed in a vacuum chamber for several hours and then transferred to air-tight containers for storage.

Fig. 5.—Effective air-tight containers.

This paper is a preliminary report on an investigation being continued in coöperation with the Department of Entomology and the Oregon State Agricultural Experiment Station. The following drugs are tabulated in the report:

Aconite, Aloe, Althea, Bitter and Sweet Almond, Angelica Fruit and Root, Apocynum, Aralia, Arnica, Asclepias, Aspidium, Belladonna Root, Berberis, Bryonia, Calumba, Sweet Flag, Cantharides, Capsicum, Caraway, Chicory, Colchicum Corm, Coriander, Cydonium, Dulcamara, Ergot, Euonymus, Fenugreek, Ginseng, Glycyrrhiza, Hydrastis, Inula, Iris, Jalap, Kava, Kola, Lappa, Linseed, Matricaria, Mezereum, Myristica, Parsley Root and Seed, Phytolacca, Pyrethrum, Pilocarpus, Rhubarb, Sabal, Sarsaparilla, Squill, Senega, Senna, Stillingia, Strophanthus, Sumbul, Tamarind, Trillium, Viburnum, Ginger.

REFERENCES.

(1) Sayre, Lucius E., "A Manual of Organic Materia Medica and Pharmacognosy," P. Blakiston's Son and Co. (1917).

(2) Dunn, Marin S., "Insect Friends and Foes," *Am. J. Pharm.*, 104 (October 1932).

[1] Kraemer's, "Scientific and Applied Pharmacognosy."

[2] Rusby, Bliss, Ballard, "Properties and Uses of Drugs."

[3] Schneider, "Microanalysis of Powdered Vegetable Drugs."

(3) Youngken, Heber, "Textbook of Pharmacognosy," P. Blakiston's Son and Co. (1930).

(4) Kraemer's, "Scientific and Applied Pharmacognosy," John Wiley and Sons, Inc. (1928).

(5) Rusby, Bliss, Ballard, "Properties and Uses of Drugs," P. Blakiston's Son and Co. (1930).

(6) Schneider, Albert, "Microanalysis of Powdered Vegetable Drugs," P. Blakiston's Son and Co. (1921).

THE VOLATILE OIL OF HYPTIS MUTABILIS.*,[1]

BY HAROLD W. WERNER.[2]

The plant, *Hyptis mutabilis* (L. C. Rich) Briquet, is widely distributed in Florida. It is not, however, generally recognized by the above name, but by the name *H. spicata* (1).

Material for this investigation was collected near Gainesville, Florida. All the plants were apparently of the same race; however, at the time of collection the material was separated into that having green stems and that having reddish stems. The two batches of plant material produced oils which appeared to be identical.

Peckholt (2) and Schimmel & Co. (3) evidently worked with different races of *H. mutabilis* as their oils differed somewhat from the oils produced by the writer. Epling (1) states that several races of the species can be recognized.

RED-STEMMED MATERIAL.

Two hundred and four Kg. of green plant yielded by steam distillation 25 Gm., or 0.012%, of a dark greenish oil with a faint mint-like odor and an after-taste resembling oil of cassia.

The constants of the oil were: 1 volume soluble in 1 to 3 volumes of alcohol, 1 volume insoluble in 4 volumes of alcohol, $d_{25°}^{25°}$ 0.8939, n_D 26° 1.4925, 0% ketones with $NaHSO_3$, 9% ketones with Na_2SO_4, 0% phenols with 4.3% NaOH. $-12^1/_2°$ C. did not cause the separation of solid matter. A solution of the oil in CCl_4 was levorotatory.

GREEN-STEMMED MATERIAL.

Two hundred and thirty Kg. of green plant material yielded 46 Gm., or 0.02%, of a dark greenish oil with an odor and taste identical with that of the oil produced from the red-stemmed material.

The constants of the oil were: 1 volume soluble in 1 to 3 volumes of alcohol, 1 volume insoluble in 4 volumes of alcohol, $d_{25°}^{25°}$ 0.8959, n_D 26° 1.4924, acid number negligible, saponification value 7.28, saponification value after acetylation 35.21. $-12^1/_2°$ C. did not cause the separation of solid matter. The optical rotation of 4 cc. of oil with 6 cc. of CCl_4 in a 100-mm. tube was −4.18.

Fractionation.—Twenty Gm. of the oil were fractionated four times under atmospheric pressure. Results are shown in the accompanying table.

DATA FOR FRACTIONS.

No.	Boiling Temp. ° C.	$d_{23°}^{23°}$.	n_D 23°.	Gm.
1	160–180	0.8522	1.46874	4.5
2	180–247	0.8800	1.48414	2.5
3	247–263	0.9103	1.49974	6.6
Residue				

* Scientific Section, A. PH. A., Madison meeting, 1933.

[1] From the Department of Pharmacognosy and Pharmacology, University of Florida, Gainesville, Florida.

[2] Professor of Botany and Materia Medica, School of Pharmacy, Duquesne University, Pittsburgh, Pa.

Fraction No. 1 was refractionated and 3 cc. were obtained which boiled between 162–164°. The $d_{20^\circ}^{20^\circ}$ was 0.8426 and n_D 23° 1.46244. The constants of this fraction indicate the presence of sabinene. The amount of material precluded further investigation.

Fraction No. 3 was treated with 70% alcohol to purify somewhat the hydrocarbons present. The residue amounting to 6 Gm. boiled at 255–259°. The $d_{20^\circ}^{20^\circ}$ was 0.9088 and n_D 24° 1.49584. The constants of this fraction indicate caryophyllene. Derivatives could not be obtained because of the small amount of material.

SUMMARY.

The above ground portion of *Hyptis mutabilis* yields from 0.012% to 0.02% of a volatile oil, constants of which have been obtained. Oils from the red- and green-stemmed plants are evidently identical. The oil has a high hydrocarbon content and the presence of sabinene and caryophyllene is indicated.

REFERENCES.

(1) Epling, C., Letter to the writer, 1931.

(2) Peckholt, *Ber. deut. pharm. Ges.*, 14, 376 (1904); *via* Finnemore, "The Essential Oils," p. 802 (1926).

(3) Schimmels' Report, page 96 (April 1904).

PHYTOCHEMICAL NOTES.

FROM THE LABORATORY OF EDWARD KREMERS.

No. 113. The Sterol from Pinus Sabiniana.

BY OLE GISVOLD.

The nonsaponifiable material obtained by J. Semb upon saponification of the fatty oil extracted from the seed of the Digger's pine had been turned over to Kurt Bonstedt. By the digitonin method he isolated a sterol which, however, was contaminated by hydrocarbon material as became apparent in the attempt to recrystallize it. Purification of the sterol was effected by allowing it to crystallize from its alcoholic solution. The paraffin which separated with the sterol upon cooling was brought into solution by gently heating the mass for a few moments. As soon as this had been accomplished the sterol crystals were removed by suction filtration. They melted at 137.5° and the acetate melted at 127.5°.

Inasmuch as the mother liquid containing the hydrocarbon also contained some sterol, this was separated by the digitonin method. The digitonide obtained was mixed with sand and the mixture extracted with ether for several hours to remove the hydrocarbons. This accomplished the digitonide was resolved into its components with boiling xylene. The sterol thus obtained revealed the same melting point as that recorded above, the melting point of its acetate also corresponded with that given above.[1]

The sterol contained in the fatty oil from the seeds of *Pinus sabiniana*, therefore, appears to be a sitosterol.

Dr. Roy Gardner closed his remarks before the Australian and New Zealand Association for the Advancement of Science (1935) by saying "Pharmacy as a field of work dealing with health has its own responsibility and a share of the general responsibility for watching the growth of science, and seeing that the world makes a right use of it for the benefit of mankind."

[1] Windaus, A., *Z. physiol. Chem.*, 65, 110 (1910).

THE VALUE OF TOLU COATING, U. S. P. X AND N. F. V.

BY F. S. BUKEY AND MARJORIE BREW.*

The use of tolu as a coating for pills has been recommended for more than seventy-five years. Some of the early investigators even went so far as to employ tolu in forming the mass for phosphorus pills. They made the statement that tolu is soluble in the gastric juice and forms a more plastic pill mass. They also suggested the use of beeswax and tolu as a base for phosphorus pills. Tolu coating is also highly recommended by our present-day textbooks of Pharmacy, as well as being the official coating for Pills of Phosphorus and Pills of Ferrous Iodide.

The authors have found in making enteric coatings that tolu is resistant to the processes of digestion. This leads to the conclusion that possibly tolu coating for these official products is of little value. With this idea in mind, a study was made of tolu-coated pills to determine the percentage of disintegration in the body.

The efficiency of the tolu coating was determined by making some pills, approximately the same size as the official Pills of Phosphorus. The formula for the mass used was as follows:

Methylene Blue	1 Gm.
Althea, powder	12 Gm.
Acacia, powder	6 Gm.
Barium Sulphate	10 Gm.

A mass was made by moistening the ingredients with a sufficient quantity of a mixture of 2 parts of glycerin and one part of water. This mass was then divided and made into 200 pills.

The barium sulphate was added to the mass so that the X-ray could be used to definitely locate the position of the pills in the digestive tract. The methylene blue, by its property of coloring the urine, made possible the determination of the disintegration in cases where the X-ray was not used. The dye was also of value in determining the entirety of the coat. The dried pills were coated with tolu according to the formula given in the U. S. P. The reason for using this coating on Pills of Phosphorus is to form an air-tight seal protecting the phosphorus from the air. If air should come in contact with the mass of either Pills of Phosphorus or Pills of Ferrous Iodide, oxidation would take place in time, which would make the pill of little value. For this reason, it would be necessary to have the tolu coat entire. By placing the pills in water small openings might be detected by the leakage of the methylene blue. This test was made after the application of each coat until no further evidence of blue was noted. Microscopic examinations of the finished pill showed the coating to be on the average of about 0.1 mm. in thickness. These determinations of thickness were made because of the fact that it might be claimed that the pills were coated too heavily. The authors are confident that the coating was no thicker than required to protect the pill. Further microscopic examinations of these coats showed that the tiny depressions in the surface of the pill would not coat as heavy as the smoother surfaces, thus making weak spots in the coat. It is the opinion of the authors that if the coat could be applied uni-

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formly, these pills would be as impervious to water and the digestive fluids as lead shot.

Some of the early investigators made the discovery that old tolu, which had lost most of its volatile oil, was better for a coating than the fresher balsam. The authors agree with this statement as the results of their experiments indicate that there was greater disintegration of pills coated with tolu which was over ten years old. This is believed to be true, because old tolu is more brittle and, therefore, cracks more easily.

In order to be certain that the samples of tolu were not of an inferior grade, the pills were coated with tolu obtained from four different sources: J. L. Hopkins & Co. (4), S. B. Penick & Co. (1), Eimer and Amend (3), Chas. Huisking and Co., Inc. (2).

The coatings were tested in two ways, by the use of the X-ray and by giving an individual one of the pills and then observing the color of the urine for sixty hours. When the X-ray was used, the subject was given six pills. Radiographs were then taken at desired intervals until the pills were excreted from the body or were disintegrated. In most cases, these experiments extended over two days. A small teaspoonful of Bari-o-meal in a glass of water, was given before the first radiograph was taken in order to locate the stomach. The shadow produced by this amount of Bari-o-meal was not heavy enough to mask the pills.

The results obtained by giving the subject a single pill, coated with tolu, purchased from (1) were as follows:

Thirty-seven subjects were used, 23 subjects were used more than once, 8 of the 23 subjects showed no disintegration. In no case where the subject was used more than once was it found that every pill disintegrated; 109 pills were given; 31 pills disintegrated. The percentage of disintegration was 28.44.

The disintegration time was as follows:

One to 5 hours, 1 pill; 6 to 10 hours, 1; 11 to 15 hours, 7; 16 to 20 hours, 3; 21 to 25 hours, 5; 26 to 30 hours, 6; 31 to 35 hours, 5; 36 to 40 hours, 1; 41 to 45 hours, none; 45 to 50 hours, 2 pills.

The X-ray experiments with (1) tolu gave the following results, with the four subjects that were used:

Subject 1, pills disintegrated, 1; excreted, 4; undetermined, 1. Subject 2, disintegrated, 3; excreted, 3; undetermined, none. Subject 3, disintegrated, 2; excreted, 4; undetermined, none. Subject 4, disintegrated, none; excreted, 5; undetermined, 1.

The following table gives the number of pills with their time and location of disintegration and the time of excretion:

TABLE I.

Time in Hours.	5.	10.	15.	20.	25.	30.	35.	40.	45.	50.
Stomach	18	13-2D[1]	5							
Small intestine	6	2	1							
Ascending colon		1D	1	12	10	3	3			
Transverse colon			1D	2D		4	1	2	2	
Descending colon						2	2	4	4	
Pelvic colon			3	3		2	5			1
Excreted				3	2	1		3		7

[1] The letter D is used to designate disintegration. The number preceding the D is used to designate the number of pills disintegrating and the number in front of the dash is the total number of pills, inclusive of the ones disintegrating in the given location, for example, stomach 5-2D.

The results obtained by giving the subject a single pill coated with tolu purchased from (2) were as follows:

Twenty-seven subjects were used; 10 subjects were used more than once, 5 out of the 10 subjects showed no disintegration. In the case of one subject, who was used more than once, it was found that every pill disintegrated; 49 pills were given; 14 pills disintegrated. The percentage of disintegration was 28.57.

The disintegration time was as follows:

One to 5 hours, 1 pill; 6 to 10 hours, none; 11 to 15 hours, 2; 16 to 20 hours, none; 21 to 25 hours, 4; 26 to 30 hours, 3; 31 to 35 hours, none; 36 to 40 hours, 2; 41 to 45 hours, 2; 46 to 50 hours, none.

In the X-ray experiments using (2) tolu, seven subjects were used and the results were as follows:

Subject 1, pills disintegrated, none; excreted, 2; undetermined, 4. Subject 2, disintegrated, 3; excreted, 1; undetermined, 2. Subject 3, disintegrated, 3; excreted, none; undetermined, 3. Subject 4, disintegrated, 1; excreted, 4; undetermined, one. Subject 5, disintegrated, none; excreted, 6; undetermined, none. Subject 6, disintegrated, 1; excreted, 4; undetermined, 1. Subject 7, disintegrated, 3; excreted, 3; undetermined, none.

The following table gives the number of pills with their time and location of disintegration and the time of excretion.

TABLE II.

Time in Hours.	5.	10.	15.	20.	25.	30.	35.	40.	45.
Stomach	22	17-3D	6						
Small intestine	19	9-1D	1						
Ascending colon	1	13	14-1D	4	10-1D	5-1D			
Transverse colon		1	4	2	4-3D		2	1D	
Descending colon		2	1		1				
Pelvic colon			1	11	9	9	6		
Excreted					13	2	2	3	

The results obtained by giving the subject a single pill coated with tolu purchased from (3) were as follows:

Twenty-two subjects were used; 16 subjects were used more than once; 3 of the 16 subjects showed no disintegration. In the case of three subjects who were used more than once, it was found that every pill disintegrated; 67 pills were given; 35 pills disintegrated. The percentage of disintegration was 52.23.

The disintegration time was as follows:

One to 5 hours, 1 pill; 6 to 10 hours, 4; 11 to 15 hours, 3; 16 to 20 hours, 5; 21 to 25 hours, 11; 26 to 30 hours, 4; 31 to 35 hours, 1; 36 to 40 hours, 1; 41 to 45 hours, 5; 46 to 50 hours, none.

The results of the X-ray experiments using seven subjects may be tabulated as follows:

Subject 1, pills disintegrated, 4; excreted, 1; undetermined, 1. Subject 2, disintegrated, 2; excreted, 4; undetermined, none. Subject 3, disintegrated, 6; excreted, none; undetermined, none; Subject 4, disintegrated, 2; excreted, 4; undetermined, none; Subject 5, disintegrated, 2; excreted, 4; undetermined, none. Subject 6, disintegrated, 4; excreted, none; undetermined, 2. Subject 7, disintegrated, 3; excreted, 1; undetermined, 2.

The following table gives the number of pills with their time and location of disintegration and the time of excretion:

TABLE III.

Time in Hours.	5.	10.	15.	20.	25.	30.	35.	40.	45.	50.
Stomach	17-1D	8	4							
Small intestine	19-1D	6-4D	7-1D							
Ascending colon	3	11	10-1D	6	9-1D	5				
Transverse colon	2	2	3-1D	3	7-3D	4-1D				
Descending colon	1	1	2-1D	2	4-3D			3-3D		
Pelvic colon			3	1	4					
Excreted			3	4	1	6				

The results obtained by giving the subject a single pill coated with tolu, purchased from (4) were as follows:

Twenty-six subjects were used; 19 subjects were used more than once; 5 subjects out of 19 showed no disintegration; 1 subject out of the 19 showed total disintegration; 61 pills were given; 22 pills disintegrated. The percentage of disintegration was 36.65.

The disintegration time was as follows:

One to 5 hours, none; 6 to 10 hours, none; 11 to 15 hours, none; 16 to 20 hours, 4 pills; 21 to 25 hours, 7; 26 to 30 hours, 8; 31 to 35 hours, 1; 36 to 40 hours, none; 41 to 45 hours, 2; 46 to 50 hours, none.

The results of the X-ray experiments using four subjects may be tabulated as follows:

Subject 1, pills disintegrated, 3; excreted, 1; undetermined, 2. Subject 2, disintegrated, 4; excreted, 2; undetermined, none. Subject 3, disintegrated, 2; excreted, 4; undetermined none; Subject 4, disintegrated, 2; excreted, 4; undetermined, none.

The following table gives the number of pills with their time and location of disintegration and the time of excretion.

TABLE IV.

Time in Hours.	5.	10.	15.	20.	25.	30.	35.	40.	45.	50.
Stomach	18	6	6							
Small intestine	3		4-2D							
Ascending colon	2		7-1D	11-2D	7-1D	6	1D	2-1D		
Transverse colon			2	5	3	2-1D		1-D		
Descending colon			3		1	2		1		
Pelvic colon			2	1-D	2	2	2	2	2	
Excreted				4	1			2	2	2

By summarizing all the experiments, the following results were found:

Two hundred eighty-six pills were given; 112 subjects were used; 102 pills disintegrated. The percentage disintegration was 35.66.

The average for the disintegration time is shown in the following table, which gives the number of pills disintegrated at five-hour intervals. It will be noticed that the highest number of pills disintegrated in 21 to 30 hours, which would indicate that most of them were in the colon before disintegration took place. For proper medication, disintegration should take place before the pills reach that part of the alimentary canal:

One to 5 hours, 3 pills; 6 to 10 hours, 5; 11 to 15 hours, 12; 16 to 20 hours, 12; 21 to 25 hours, 27; 26 to 30 hours, 21; 31 to 35 hours, 7; 36 to 40 hours, 4; 41 to 45 hours, 9; 46 to 50 hours, 2.

It is evident, from this data, that the further use of tolu as a coating should be discontinued, since in 64.34 per cent of the cases no medication whatever was obtained and in many cases where disintegration was obtained, it probably occurred too late for proper absorption. It is therefore recommended to the U. S. P. and N. F. Revision Committees that gelatin coating be substituted for tolu coating in the forthcoming revisions.

The authors wish to express their appreciation to the students of the College of Pharmacy, University of Nebraska, for their coöperation in this study.

SHARK LIVER OIL.*

BY W. S. JONES AND W. G. CHRISTIANSEN.[1]

As part of our investigation of fish liver oils as sources of Vitamins A and D we have examined the liver oils from a number of species of shark. The commercial samples have generally proved to be not only very poor in taste and color but, with one exception, inferior to cod liver oil in Vitamin A content. Estimation of Vitamin A was made colorimetrically by the antimony trichloride method, using a biologically assayed cod liver oil for comparison, and these data together with those of free fatty acid and unsaponifiable matter, are listed in

TABLE I.—COMMERCIAL OILS.

	Species of Shark.	% F. F. A.	% Unsaponifiable.	Estimated Vitamin A.
1.	Dusky	0.088	2.71	645
2.	Leopard	0.186	11.41	410
3.	Nurse	0.059	2.79	905
4.	Sawfish	0.079	4.85	168
5.	Sun	0.079	5.95	4500–6000

Lack of care in the rendering of these oils may easily account for low vitamin content as well as the highly unsatisfactory odor and taste. We therefore prepared a number of oils from fresh livers, using careful, anaerobic technique in order to obtain oils with their full vitamin content, free from the putrid, very fishy and ammoniacal odor and taste observed in the commercial samples. The rendering process is as follows:

The shark liver is macerated and placed in a steam-jacketed, enameled kettle. A small amount of water is added and the mass, agitated the while, is heated to boiling. The boiling is continued 20 minutes with intermittent stirring. The tissue breaks up readily and, when the steam is shut off and the mass cools, settles out, leaving a layer of oil which is easily removed. The oil is mixed with a filter aid and filtered. As before stated, air is excluded, the oil being protected by an inert gas throughout the process.

The following data were obtained on the oils produced in the manner described above:

TABLE II.

Sample No.	Species of Shark.	Color of Oil.	% F. F. A.	% Unsaponifiable.	Vitamin A. Colorimetrically Estimated.	Vitamin A. Biologically Determined.	Vitamin D. Biologically Determined.
1.	Nurse	Yellow	0.28	1.69	868	..	..
2.	Sawfish	Reddish yellow	0.42	3.00	3400	2222	14
3.	Sand	Water-white	0.16	9.6	200	..	..
4.	Leopard	Orange	0.16	12.4	3080	2700	<14
5.	Nurse (male)	Yellow	0.28	..	400	..	..
6.	Nurse (female)	Yellow	0.84	..	400	..	..

In each instance one whole shark liver was rendered. The livers vary in weight from 15 lbs. for No. 5 to 55 lbs. for No. 2. The yield of oil was, of course, lower than would be obtained

* Section on Practical Pharmacy and Dispensing, A. PH. A., Washington meeting, 1934.

[1] Research Department of the Chemical and Pharmaceutical Laboratories, E. R. Squibb and Sons, Brooklyn, N. Y.

by a solvent extraction method, but in every case was better than the normal recovery from cod livers. The lowest yields, 48.6 and 51.7% were obtained on the two smallest livers, Nos. 5 and 6; the other Nurse liver, however, weighed 36 lbs. and yielded 66% of oil. The largest liver, No. 2, gave a yield of 55.3%, and the highest yield, 70.8%, was obtained on No. 4, which weighed 43 lbs.

When these oils were tested colorimetrically for Vitamin A it was found that those from the Sawfish and Leopard species gave much higher values than any of the others, whereas the commercial samples from those two species had given the lowest values. When assayed biologically the specially prepared Sawfish and Leopard oils gave Vitamin A values of 2222 and 2700 U. S. P. X units, respectively, and the cod liver oil control showed 1566 U. S. P. X units. The two shark liver oils were therefore 50–80% stronger in Vitamin A than cod liver oil.

While two of the shark liver oils proved to be considerably more potent than cod liver oil with respect to Vitamin A, they were only one-tenth as strong in Vitamin D, each having about 14 Steenbock units as against 134 in the cod liver oil.

These carefully prepared oils were all free from any putrid or ammoniacal taste or odor, and had only a slight natural fishy taste. They all deposited stearine on standing at room temperature.

SUMMARY.

1. Commercial samples of liver oils from the Dusky, Leopard, Nurse, Sawfish and Sun sharks were tested colorimetrically for Vitamin A.

2. Oils were prepared from the fresh livers of Nurse, Sawfish, Sand and Leopard sharks and were tested colorimetrically for Vitamin A.

3. Oils from the fresh livers of Sawfish and Leopard sharks were assayed biologically for Vitamin A and D.

THE PROBLEMS* OF THE TEACHERS AND STATE BOARD EXAMINERS.[1]

BY HARRY W. MANTZ.[2]

The Teachers of Practical Pharmacy and Dispensing will no doubt agree that the scope of their subject is gradually changing and becoming more complicated. Many causes might be cited, but two of the outstanding are: First, the limited amount of practical drug store experience possessed by the individual when he enters the Pharmacy School and when he appears before the State Board Examiners to prove that he is qualified to practice the profession of Pharmacy; *second*, the large number of new preparations put on the market and the lack of knowledge, concerning these preparations on the part of the physician, the pharmacist and the teacher of pharmacy.

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* Of Practical Pharmacy and Dispensing.

[1] Section on Practical Pharmacy and Dispensing, A. PH. A., Washington meeting, 1935.

[2] Associate Professor of Pharmacy, Director of the Pharmacy Laboratories, Temple University.

The State Boards are gradually decreasing the amount of practical experience necessary to meet their requirements. The result being that it is now necessary for the teachers to supply the training in the school which was heretofore obtained in the drug store. Our forefathers learned the profession by applying one of the basic laws of learning—"Learn by Doing;" no one will deny that this is the most efficient way of learning. Is it possible then for an instructor to supply this demand in the comparatively short time allotted?

The teacher of practical pharmacy and dispensing does not find it a burden to teach the processes and procedures for the manufacture of the U. S. P. and N. F. compounds and preparations. The pharmacist, however, is not only confronted with these, but with hundreds of others and combinations of them. This being the case it would seem necessary for the teacher to include instruction on these new preparations in order to accomplish that which is expected of him—to prepare the student to practice the profession of Pharmacy and meet the State Board requirements. The question then arises, if the new preparations are considered, at what point should the instruction end? It was pointed out in a paper presented at a meeting last year that nearly four million combinations are possible—to be obtained from one hundred drugs with four in a prescription. This proves that it is not possible for the teacher to give instruction on all the compounds and possible combinations, but only on the basic principles underlying the art of compounding and dispensing. This can best be accomplished by giving the student work which runs parallel to that carried on in the laboratories of the drug stores.

The examiners are also confronted with difficult problems and a good idea of these can be obtained by reading the proceedings of the joint meetings of members of the State Boards of Pharmacy and delegates of the American Association of Colleges of Pharmacy. Briefly, they are as follows: First, "How many and what type of preparations and prescriptions should be given in order to determine how much the applicant knows?" Second, "How many times should the applicant be allowed to make the preparations or compound the prescription?" Third, "What method should be used for grading the preparations and prescriptions?"

These questions have been discussed and no definite agreement has been reached, although the problems are of utmost importance. The teachers of Materia Medica have submitted a definite list of drugs, on which the examinations are to be based and, likewise, if the examiners and teachers of practical pharmacy were to coöperate, plans for uniform examinations could be made. It is realized that a definite list of preparations would hardly be possible; therefore, the suggestion for uniform examinations.

The aim of the examiner should be to find out what the applicant knows and not what he does not know. This is best accomplished be giving a comprehensive examination. Therefore, the more preparations and prescriptions given, the better it would be for both the examiner and the candidate. Four preparations or prescriptions are not sufficient to determine the qualifications of the individual; ten would seem a more satisfactory number. The type of preparations, the number of chances given to the individual to make the preparation, or compound the prescription and the method of grading are inter-related.

Most State Boards allow only one chance to make the preparation; providing this rule is followed. This suggestion is offered—that sixty per cent of the examina-

tion consist of U. S. P. and N. F. preparations with the directions for manufacturing given. It is only fair to give the applicant the same privileges which the pharmacist has in the drug store. If the directions are given and he has acquired the proper technique, he should be able to make a preparation the first time with perhaps the exception of emulsions. This would give the applicant a chance to make a grade of sixty per cent and the remaining forty per cent should consist of work on prescriptions, without directions given. In the writer's opinion, it is not fair to expect an odd prescription to be compounded correctly the first time, and in order to be fit for dispensing, it should be perfect to the degree which is possible. The prescriptions given in examinations often consist of odd combinations on which a certain amount of experimentation had to be done to ascertain the best method for compounding. This, no doubt, suggested the idea to the examiner that it would make a good State Board question. Why expect more from a man with a limited amount of experience than from the one who has had at least ten years? In many cases no basic principles are demonstrated in these combinations.

One point which the State Boards overlook, as far as the writer has been able to determine, is the applicant's ability to read original prescriptions. It would seem more important to be able to read a physician's handwriting and decipher a prescription, than to identify drugs. This could be made a part of the work on dispensing prescriptions in the examination. The remainder of the examination should consist of determining whether the candidate is qualified to handle a prescription from the time he receives it until it is ready to be handed to the customer. Every one present is acquainted with these proceedings without taking the time to enumerate them. If the candidate is not capable of making fifteen per cent on the remainder of this work, which will give him a passing grade, he is not qualified to receive a certificate of registration.

PROFIT—THE WAY OUT OF THE DEPRESSION.*

FOR THE NATIONAL RECOVERY ADMINISTRATION.

BY W. BRUCE PHILIP.

To protect the consuming public the prices of drugs, medicines, toilet articles and drug sundries, must be at such a price level as to allow adequate pharmaceutical service.

A code of Fair Competition, for the retail drug trade, must be a guide, not for a few exception drug stores, but for at least ninety per cent of the 60,000 drug stores in the 48 states. This ninety per cent of the total number of drug stores serve at least ninety per cent of the geographical territory of the United States. This same ninety per cent of the drug stores serve at least seventy-five per cent of the country's population. If the Code of Fair Competition for the Retail Drug Trade will not bring recovery to the ninety per cent of the retail drug trade, the code then ceases to be a Code of Fair Competition for the Retail Drug Trade, and becomes a special code for a favored fraction of the retail drug trade.

* Section on Commercial Interests, A. PH. A., Washington meeting, 1935.

The laws of every state in the Union, and the District of Columbia, demand that "drugs" be sold by registered pharmacists. One finds mention in the Code to "registered pharmacists," "assistant pharmacists," and "apprentice pharmacists." This imputes at once the handling of drugs by highly skilled persons. The Code for the Retail Drug Trade of course recognizes that persons other than retail clerks are necessary for drug stores.

It is also self-evident that on account of these stringent State and District of Columbia pharmacy laws, that if a drug store has only one employee, and he is left alone in the drug store, that person must be a registered pharmacist.

All this points toward the fact that in smaller retail drug stores a minimum code wage is not apt to be a maximum drug store wage, unless the Fair Trade provisions are inadequate, and fair wages cannot be paid. In larger drug stores where greater supervision is possible, and work of the drug store can be segregated and delegated as routine work, work wherein only limited knowledge is required, a large number of minimum wage workers may be possible. A low overhead thus obtained should not control 90 per cent of the drug trade industry.

It must at all times be remembered that *all* fair trade provisions must be important and necessary factors and will control the selling power of all drug store items, controlled by the Code. These provisions must not create an undue hardship on items needed by the consuming public for the protection of health. No item must be placed by provision of the Code, so low that other items will be unduly high in price.

No item can be sold from a drug store without certain fundamental charges entering into the "cost" to the public of the item sold. If these charges do not enter into the sale price, the sale is not an honest sale. It must be remembered that where the burden of the expense of selling one item is not to be found in the cost of that item to the public, then that burden of the selling of that particular item must be added in the cost of another item, or several items. The public must pay the cost of handling all items.

The following figures make clear just what is meant. Figures easily seen at a glance have been chosen:

A drug store's overhead is arbitrarily placed at 30 per cent. By overhead is meant the service furnished by the retail druggist, and includes such items as labor (clerk hire), rent, taxes, etc.

To illustrate, let us say four items, *a*, *b*, *c* and *d*, are purchased, all different, each one of the four costing seventy cents. If each item is sold for one dollar, the consuming public pays the merchant the manufacturer's wholesale price for the item, plus the fair share of operating expense needed to buy (house) and sell these four items.

But if one item, *a*, is sold at 70 cents retail (this is according to the Code of *Fair Competition* for the Retail Drug Trade, definition of "cost") to pay the wages, rent, taxes, etc., that make up the 30 cents overhead on the item, *a*, there is a choice of spreading the 30 cents needed to see, *a*, over *b*, *c* and *d*. Shall the price of *b* be raised to $1.30 when it is already carrying 30 cents, its full share of wages, rent, taxes, etc., or shall *b* and *c* be raised to $1.15, or shall *b*, *c* and *d*, be raised to $1.10 each?

It may be asked what is fair in an alleged "Fair Trade Practice" provision that

allows this unfair practice? Remember this illustration does not allow one cent of net profit.

If, *a*, *b*, *c* and *d*, are purchased by different people, whom should these people overpay so one can buy an underpriced item? Why gyp three-fourths of the consuming public?

The NRA should tell the public and stand firmly on the fundamental truth, that if the consuming public is to have drug stores and drug store service, then the consuming public must pay the overhead expenses, must pay the profit that goes into giving adequate protection needed to sell the items peculiar to this Code.

When a drug store opens its door each morning, out of sales alone, labor, rent and taxes must be paid. The more items sold at cost, the lower must be the wages and the more unfair to the consuming public must be the price on other items sold.

Surplus, excess stock of goods on hand, and credit once possessed to a degree by the retail druggist, has been exhausted by four years of depression.

The consuming public has received all this reserve the 60,000 drug store owners once had. Much of the credit exhausted by the corner drug store owner during the last four years went to the unemployed, and to those whose purchasing power was greatly reduced, and is a debt the consuming public can pay by demanding a fair code provision for the retail drug trade, instead of demanding sales without profit.

The issue, therefore, must be squarely faced that since surplus excess stock and credit can no longer be counted upon by the drug trade, to-day's drug store profit in sales must now be considered exclusively to pay labor, wages and taxes. Wages paid to drug clerks and other employees at once become consuming public purchasing power.

If "recovery" is to come to 90 per cent of the owners of retail drug stores in the United States, under the National Industrial Recovery Administration, the National Recovery Administration and the Code of Fair Competition for the Retail Drug Trade, present-day sales must represent three things, namely, Cost of Merchandise, Overhead and Net Profit.

Net profit, if made on sales to-day will be used by the retail druggist for a long time to come, to pay bills, and debts accumulated during the past four years of depression; debts that are, respectively, labor charges, rents and taxes, paid after the surplus and reserve were exhausted, now existing largely in debt to manufacturers, and wholesale drug houses.

It must be admitted by all, that if *sales* now made do not pay Cost of Merchandise and Overhead, then bankruptcy stares the members of the drug trade in the face, and lack of adequate drug service will become a consumer's problem.

If cost of merchandise and overhead are not carried by cost, is not then the Code for the Retail Drug Trade demanding that the druggist fail to pay his employee; fail to pay his rent; fail to pay his taxes, or fail to pay for his merchandise?

Failure to pay for either overhead or merchandise is not in the consumer's interest. It is not in a recovery program. Without profit, purchasing power of dependent employees is slowed up or stopped, and unemployment increases.

Alleged efficiency in business cannot be the subterfuge to place *unfair* competitive provision into the Code of Fair Competition of the Retail Drug Trade.

When the retail druggists hire labor they cannot go into the household or personal living efficiency of the employee, and thus set a lower wage level.

If an employee owns his own home, or has his own orchard, or garden, or if the employee can buy his provisions in large quantities or can make his own clothes, the employer cannot take these things into consideration and pay a wage below the minimum even if the saving is passed on to the consuming public.

The Code of Fair Competition for the Retail Drug Trade is for 60,000 drug stores, and unfair trade practices should not be written into it, because a few druggists own their own buildings, or have an advantage in buying, which if allowed to influence the Code provision, will injure a large number of drug stores.

The fact must never be lost sight of that alleged efficiency means, keeping down overhead, and the consuming public must know just what keeping down overhead means.

The largest item in overhead or expense is labor. Therefore, alleged efficiency is making minimum wages, maximum wages. Efficiency means, immediately laying off help that may not be needed, and seeing that the number of employees are kept at the minimum. Alleged efficiency means, discharging an employee immediately when he shows signs of failing to produce maximum results under minimum wage conditions.

Controlling over 90 per cent of the drug business by an alleged efficiency of the less than 10 per cent of the 60,000 retail drug stores, is to repudiate the Declaration of policy, Section 1, of the National Industrial Recovery. Alleged efficiency is taking advantage of every employee so that the largest expense item in a store's overhead will be kept down.

Consider that during the last four years of depression, workers had no minimum wages. Clerks repeatedly in cut-rate stores, took anything for a job. Is it surprising that less than ten per cent of the 60,000 drug stores now can show an alleged efficient low overhead made so by a low wage?

Every dollar that helps to improve industry comes out of profit—that is, a sale or service price above cost of goods or materials.

Why dodge the issue, why lie about it? A sale without profit is without honor under any code. A sale without profit is a direct slap at the unemployment problem.

The codes, and the NRA prohibited the employment of labor without the payment of wages. Why have not the NRA, and the code provisions, placed a "sale" on an honest basis like a minimum wage? That honest basis is not an honest definition of cost alone. Trading dollars never paid a cent of wages to the labor needed to make the swap.

To demand that purchasing power be increased before profit is made, is ridiculous. It is not a question of which comes first, the hen or the egg.

What happened ten million years ago is not being discussed; we are talking about what will happen now. Believe it or not—without a hen, you have no egg. Without a profitable sale, there is no means to pay the employee. Without profit there is no purchasing power, and as profit becomes fair, purchase power rises from the minimum.

When 90 per cent of the retail drug trade by official representation in September 21, 1933, asked the NRA for a code, a demand for a fair profit was made also. This demand has been repeated almost daily since that time.

Ninety per cent of the retail drug trade cannot be wrong when it comes to

knowing what the retail drug store needs, so that employment can be increased and purchasing power can be raised.

Ninety per cent of the retail drug trade cannot be wrong when it comes to knowing what are fair and unfair trade practices in the retail drug business.

Among all the people of the NRA that have opposed the giving of fair profit over cost to pay labor, rent and taxes, not one person is known to the speaker who is qualified as a pharmacist. What American principle is it that allows a few untrained officials to retard an industry that speaks ninety per cent strong—an industry that holds a good share of the public health of 125,000,000 people in their keeping, and have followed a fair trading policy and service here in America, as long as we have had a nation?

REVOLUTIONARY ACCOUNT BOOK OF CHRISTOPHER, JR., AND CHARLES MARSHALL.

BY CHARLES H. AND MILLICENT R. LAWALL.

The Marshall Drug Store, which was one of the prominent pharmacies of Colonial America, was founded in 1729 at Front & Chestnut Streets, Philadelphia, by Christopher Marshall, Sr., who had been born in Dublin, Ireland, and who had first settled among the "Friends" of Bucks Co., Pennsylvania, where he became a member of the Middletown Monthly Meeting. In 1735, the store was moved to Chestnut Street above Second Street (now the site of 214 Chestnut Street), where it continued for more than a century at "The Sign of the Golden Ball."

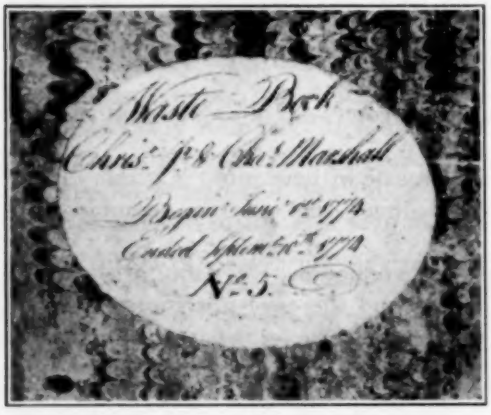


Fig. 1.—Upper part of cover of Waste Book.

Christopher Marshall, Sr., was a "fighting Quaker," who was prominent in Colonial as well as civic affairs. In 1765, he took in with him as his partners, his sons, Christopher, Jr., and Charles, and they succeeded to the business in 1772. Charles Marshall, the active head of the new firm, was an apothecary, druggist, botanist and chemist, who developed a fine reputation among the leading physicians of the city for his integrity, skill and care. He became, in his old age, the first president of the Philadelphia College of Pharmacy, in the archives of which the book was found which furnishes the subject of this study.

It is a typical "Day Book," about 8 by 12 inches in size, bound in a cardboard cover, with a typical mottled design of scallops of red, white, green and blue (see Fig. 1). It bears an oval label on which is written:

"Waste Book, Chris. Jr. & Chas. Marshall. Began June 1st, 1774 Ended Septem. 10th, 1774. No. 5."

It contains 32 leaves. There is one leaf cut or torn out, and two pages have been left blank, obviously through inadvertence.

The entries consist of a curious miscellany reflecting the character of the business and the customs of the times. Prices are given in pounds, shillings and pence.

The first entry in the book is both interesting and informative, for it is repeated a number of times later on with variations as to date and person, but not as to the ratio of value. It is as follows: "Will Marshall, Dr., to cash, One Dollar = 7/6. This establishes the value of the unit which was then called the dollar in terms of

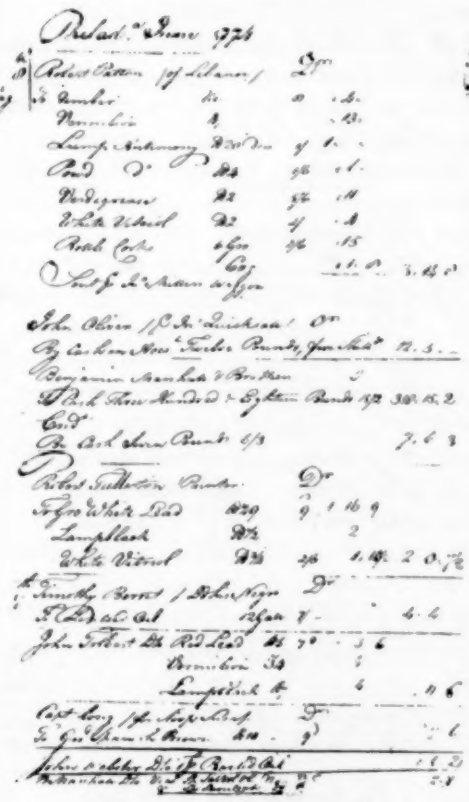


Fig. 2.—Leaf from Waste Book.

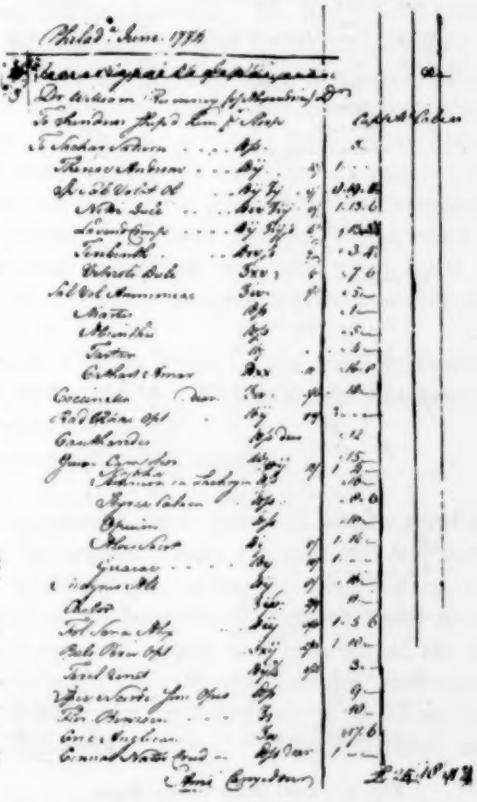


Fig. 3.—Leaf from Waste Book.

the pound sterling. At the rate of 20 shillings to the pound, the exchange value was 1 £ = $2.66.

One of the first impressions gained by a study of the entries is, that "our fathers of old" were not particularly careful in their spelling.

Another fact which is obvious is, that while the major part of the business was in drugs and medicines, there was an extensive trade in paints, oils and window glass. It is also apparent that there was considerable trade with sailing vessels. The geographic range of the customers covered a fairly large area, ranging from Lancaster and Lebanon, Penna., on the north; to Alexandria and Winchester, Virginia, on the south.

Among the items of paints, oils and painting materials, etc., are the following:

Verdigrease, Stone Oker, Fig blue, Verditer, Rose pink paint, Straw colored paint, Dutch pink, Mahogany color, Venetian red, Blue smalts, Red lead, White lead, Spanish brown, Linseed oil, Boiled oil, Lamp black, Powdered yellow oker, Litharge, Spanish whiting, Blue paint, Brushes, Brushes Camel hair, Spts. Turpentine, Black paint, Ground green paint, Gold leaf, Putty, Red chalk, Ivory black, Umber, Black lead, Stone colored paint.

When we come to the items connected with the shipping trade, we are not always certain whether they are for use on the vessel or for some customer at a distance.

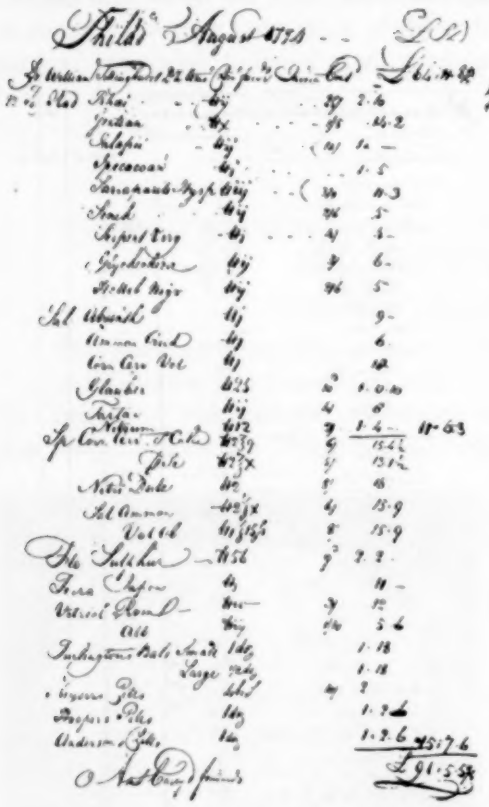


Fig. 4.—Leaf from Waste Book.

Fig. 5.—Leaf from Waste Book.

That these were the days of sailing ships is indicated by the following vessels named in the entries:

Schooner Crosby	Brig Morning Star
Schooner Peggy	Brig Friendship
Schooner Polly, Capt. Vicary	Ship Success, Capt. Long
Schooner Betsey, Capt. Patterson	Ship Prosperity, Capt. James Stuart
Schooner Speedwell	Ship Elizabeth
Schooner Nellie, Capt. Scott	Ship Minerva, Capt. Willson
Sloop Hote, Capt. Vallance	Charlestown Pacquet
Brig Nancy	Trenton Shallop

Among some of the miscellaneous items of interest are the following:

"John Ross, delivered to his negro man, on order" (this reminds us that slaves were owned in colonial days).

"Jacob Fetter, sent by Shank's wagon." (Was this wagon drawn by the original Shank's mare?)

"James Claypoole, delivered to his lady."

"Emanuel Holmes, one vomit, 9 pence."

"A mixture, secundum recipe, delivered by John Day's post."

"Charge against Pritchard—married Widow King."

"Aug. 6, Bought 3 cords wood for 3/6."

"Delivered by stage driver to Princetown."

"To Capt. James Weir to sundry medicines to wright (sic) his medicine box and for grinding a lancet."

We find that Dr. Chovet was an almost daily customer. Dr. Abraham Chovet was a famous physician of Colonial times, who was born in England, educated in Edinburgh, and became a demonstrator of Anatomy to the United Company of Barber Surgeons. He later settled in Jamaica, from whence he was driven by a slave insurrection. He settled in Philadelphia in 1770 and lived on Race Street above Third. He remained an irreconcilable Tory during the Revolution, and yet retained both friends and practice, gave private lectures in physiology and anatomy, and died in 1790, both honored and respected. Dr. John Morgan, whose name is well known to medical and pharmaceutical historians, and who then lived at Second and Spruce Streets, was a frequent customer, mainly for paints, during the period covered by this book.

Another famous customer, whose name appears several times was Christopher Sower, the Germantown printer, who published the first Bible in America and one of America's earliest newspapers—*The Germantown Gazette.*

Let us now look at a few of the pages produced in facsimile.

Illustration No. 1—speaks for itself.

Illustration No. 2.—This page is concerned with items of pharmaceutical interest sent to Dr. William Rumney of Alexandria. Note the now obsolete name of the first item "Sachar. Saturn" for lead acetate. Also the second item, the Theriac of Andromachus, which was just about completing its second millenium, but which has now disappeared entirely from use. Space and time forbid the detailed discussion of all of the items. They are all worthy of detailed consideration by those who have the time and inclination. On the following page where this order is completed, we find "Ivory Glyster (sic) pipes," "ivory syringes" and "Crown lancets in a shagreen case."

In *Illustration No. 3* we find a number of miscellaneous items that require no explanation. This is also true of *Illustration No. 4.* In *Illustration No. 5*, we again encounter a page of items of pharmaceutical interest. This is part of an order which was evidently intended for the complete outfitting of a store or a physician's office—probably the latter. For this was in the days when physicians had their own dispensaries. The name of the customer is Dr. William Tillinghurst, but unfortunately the first two pages of this particular order were on the missing leaf, which had been cut out of the book at some time in the past. There are five pages of the order remaining, however, of which the third page is produced. The cost of the order totaled one hundred and twenty-four pounds, four shillings and ten pence. We shall make no detailed comment on the items on this page, except to call attention to the fact that the concluding items at the bottom of the page are all proprietaries, of which there are a number on the next succeeding page. At some

future time we may contribute another paper commenting particularly upon the pharmaceutical items in the entire book.

In conclusion we would like to call attention to the prices of some of the items which are still in use to-day. Calomel cost 30 shillings a pound; Lunar caustic, 20 shillings an ounce; there were three grades of Peruvian Bark, ranging from 20 shillings a pound up to 8 shillings an ounce; mace was sold at 32 shillings a pound and Alexandrian senna brought 8 shillings and sixpence a pound.

SECOND NOTICE FROM THE COMMITTEE ON TRANSPORTATION.

Members from the eastern states attending the 1935 meeting will naturally travel through Chicago, St. Louis or New Orleans in the United States, or by one of the Canadian lines, and very attractive excursion rates will be in effect, allowing the going and returning journeys to be made by different routes, if desired.

There is a large number of routes that may be used for either the going or returning journey, of which a few are as follows:

1. Through Chicago, Minneapolis and Glacier National Park, with stopover.
2. Through Chicago, Minneapolis and the Canadian Rockies, with stopovers.

A special Chicago party is being arranged to take a combination of routes 1 and 2, which members from other sections are invited to join. Inquiries about this party should be addressed to Prof. E. N. Gathercoal, 701 South Wood Street, Chicago, Illinois, the Chicago member of the Committee on Transportation.

3. Through Chicago *via* Yellowstone and Rainier National Parks, with stopovers if desired.
4. Through Chicago or St. Louis *via* Denver, the Royal Gorge, Salt Lake City and San Francisco, with stopovers as desired.
5. Through Chicago or St. Louis *via* the Grand Canyon, Los Angeles and San Francisco, with side trip to San Diego at small extra expense, if desired.

The excursion fares for this season have not yet been announced, but it is expected that they will be about the same as for last year, when they were as follows from several widely scattered leading cities: New York $126.90; Boston $133.25; Philadelphia $122.85; Washington $120.75; Atlanta $112.80; Cleveland $101.35; Detroit $98.30; Chicago $86.00; St. Louis $85.00. Pullman charges are to be added to these fares, with no surcharges west of Chicago and St. Louis.

Nine- to twelve-day cruises from Seattle to Alaska will be available at $85.00 and up, for fare, stateroom and meals. More information about these Alaska cruises and further details will be given in later notices.

T. J. BRADLEY, *Chairman.*

PHARMACY WEEK IN PHILADELPHIA.

Quoting in part from the report of the *P. A. R. D. Bulletin:* Like all other weeks, the week set aside for depicting "Pharmacy of To-morrow" has come and gone, but unlike most other former celebrations, it will leave impressions and results in activities for years to come. This work was planned by Chairman Anton Hogstad, Jr., and all the members will benefit in proportion to their application of the information in their own business. Those who attended were delighted with the exhibits.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

HOW SHOULD FUNDAMENTAL COURSES IN CHEMISTRY BE TAUGHT IN A COLLEGE OF PHARMACY?

BY ERNEST LITTLE.*

Is there such a thing as pharmaceutical chemistry? Is there such a thing as agricultural chemistry? Are these not special applications of the general science of chemistry? If so, should not our fundamental courses be taught by men who are specialists in their fields rather than by individuals who are able to add a few special applications to the special field for which the student is preparing? Your Editor believes that the fundamental courses in chemistry for pharmacy students can best be taught by those who had training in and full appreciation of the science of pharmacy, provided they are thoroughly grounded in the phase of chemistry they are teaching.

Chemistry has developed so rapidly that it is almost impossible to find an individual who is a specialist in more than one narrow field. It is far better to have our pharmacy students taught the fundamental courses in chemistry by specialists in each branch than that they be taught by pharmaceutically trained individuals who have only a general knowledge of chemistry. The happy combination is secured when we have a pharmaceutically trained teacher who is also a specialist in the branch of chemistry he is teaching.—C. B. JORDAN, *Editor*.

A few weeks ago Dr. Glenn L. Jenkins, chairman of the Committee on Chemistry for the Colleges of Pharmacy and Boards of Pharmacy of District No. 2, requested me to present a paper at the March meeting of these two groups. In accordance with his request I read a paper entitled "How Should Fundamental Courses in Chemistry Be Taught in a College of Pharmacy?" Following the meeting Dr. Jenkins stated that he thought the paper should be presented at this meeting and suggested that I send a copy to Secretary Jacobs for his consideration. Having learned to respect the judgment of Dr. Jenkins, I again acted upon his suggestion and was requested by Dr. Jacobs to present the paper at this meeting. Although it is substantially the same as presented at Baltimore, a number of changes have been made in order to make it more appropriate for presentation to this group.

Following this introduction, which perhaps places altogether too much of the onus for the presentation upon the broad shoulders of one of my respected colleagues, I am prepared to present the question to you for your consideration and discussion.

May I call to your attention that the title of my paper is expressed in the form of a question, rather than a positive statement: "*How* Should Fundamental Courses in Chemistry Be Taught in a College of Pharmacy?"

At our Madison meeting last August, C. J. Klemme of Purdue University presented a short paper entitled "Why Organic Chemistry Should Be Taught in the School of Pharmacy." During the presentation of his paper, Mr. Klemme stated:

"There are some things a pharmacy student should be taught that are not emphasized in general chemistry. The reason for the U. S. P. caution about ether for anesthesia will be plain if an instructor in organic chemistry discusses the formation of peroxides and their possible effects.

* New Jersey College of Pharmacy.

Discussion of chloroform would explain its decomposition into hydrochloric acid and phosgene and the use of ethanol as a negative catalyst; also why chloroform for anesthesia is made from chloral. The author feels that wherever the physical set-up of the school makes it possible, organic chemistry should be taught to pharmacy students in the school of pharmacy by an instructor who has been graduated from pharmacy."

I quote Mr. Klemme at some length in order to present just the opposite point of view from that which I hold. I am not particularly interested in where a fundamental course in chemistry is presented. That is not a matter of paramount importance. I am, however, vitally concerned about how these fundamental chemistry courses are presented and the training of the individuals who present them.

I quite agree with Mr. Klemme that the important applications of organic chemistry which he mentions, and, of course, thousands of others of equal importance, should be brought out and adequately stressed somewhere in the pharmacy course, but why try to crowd them into a course in organic chemistry? Is this not the very material from which we should construct our courses in organic pharmaceutical chemistry? Will not more of these important applications be made in materia medica and in manufacturing pharmacy as well? Most colleges of pharmacy can afford no more than three hours of class-room work a week in organic chemistry throughout one college year. Those of us who have taught organic chemistry know that is hardly enough time to present a fundamental course which is adequate to serve as a foundation upon which other more specialized courses may build. Under the best conditions, this foundation cannot be made as broad as we would like to have it, but we can see to it that what we do complete is as firm and strong as possible. Infiltrations of practical applications may make it more diversified, perhaps somewhat more interesting, but certainly weakness, rather than additional strength, will result. I think there is a great deal of wisdom in President Butler's definition of the specialist when he says: "A specialist should be a broadly educated man, sharpened to a point."

Not only are there many fundamental principles to be presented but their inter-relationships must be definitely and clearly established. Similarly, parallelisms between organic and inorganic chemistry must be pointed out in order that all the fundamental chemistry courses may be properly coördinated and adequately linked together, thus collectively offering a strong and as adequate a foundation as possible. All professional, technical and applied courses will send deep roots into this foundation and from it their sustenance and building materials are obtained. We cannot expect an adequate, useful, super-structure unless our teachers of professional subjects have been provided with an adequate foundation upon which to build, and unless they also know how to make full use of the materials which have been furnished them.

For example, it is essential that in our courses in general chemistry the students be acquainted with the fundamental principles of hydrolysis. This is, of course, done in all schools. We bring out as clearly as possible what the process of hydrolysis consists of and why the three conditions of (1) large volume, (2) low acidity and (3) high temperature, may be essential to a successful hydrolytic reaction. I doubt the wisdom, however, of taking time to point out to students in general chemistry the important application which is made of this fundamental principle

in the basic acetate separation of iron, chromium and aluminum in the presence of phosphates. If more time is available, it might rather be spent in further stressing the fundamental principle, leaving the many important applications to be brought up later, as they will be, in their appropriate places. Qualitative analysis is nothing more than an application of general chemistry. The student of qualitative analysis learns very little, if any, new chemistry. If general chemistry has been taught in an applied manner, I fear the teachers of qualitative analysis and of applied and professional subjects will find their work greatly handicapped by an ignorance of fundamentals on the part of their students.

On the other hand, when the student is studying the preparation of a solution of aluminum subacetate, as outlined in the N. F. V, the fundamental principles of hydrolysis may well be briefly reviewed and the student made to understand that the concentration of acetic acid here recommended is such as to stop or tremendously slow down the hydrolysis when the salt $Al(OH)(C_2H_3O_2)_2$ is formed, instead of allowing it to continue until the less soluble $Al(OH)_2C_2H_3O_2$ is precipitated, as is the case in the basic acetate separation of iron, chromium and aluminum. The student will also understand why it is that this solution of aluminum subacetate gradually becomes turbid as it is allowed to stand and the greatly retarded hydrolytic reaction slowly proceeds, forming a more basic and hence less soluble salt.

In presenting the Solubility Product Principle, as is done by all teachers of general chemistry, it is not at all necessary that its application in qualitative analysis, showing why cadmium sulphide will dissolve in hydrochloric acid whereas the less soluble copper sulphide will not, be even mentioned.

Again, however, in the preparation of syrup of calcium iodide, after having dissolved the iron wire in an aqueous solution containing iodine, the iron is oxidized to its higher valence before removing it by the addition of portions of precipitated calcium carbonate. This oxidation is carried out because an examination of the solubility products of ferrous carbonate and ferric hydroxide shows that the syrup will contain smaller traces of iron if it is removed by precipitation after oxidation to a valence of three. The rather pronounced evolution of carbon dioxide in this preparation may be pointed to as an evidence of the hydrolysis of ferric carbonate to ferric hydroxide, or a highly basic carbonate, and also as a reason why the precipitation of the ferric iron proceeds as rapidly and completely as it does in spite of the fact that there is so little difference in the solubility products of calcium carbonate and ferric hydroxide.

We see, therefore, that there is a great deal of fundamental chemistry in as simple a process as the preparation of Syrup of Calcium Iodide. It is, however, not essential that this preparation be even mentioned when hydrolysis, oxidation and solubility products are being discussed in the course in general chemistry.

As to the individual who should teach these fundamental courses, my chief concern is that he should be a person fundamentally trained in chemistry. If he be a teacher of organic chemistry, he should have a thorough grasp of the whole field of organic chemistry. He should have a tremendous reserve of the subject as a background, which he is not compelled to draw upon in his every-day, class-room work. An individual so grounded, who is also a graduate pharmacist, should prove to be a very successful teacher of this subject. It seems to me to be more essential that teachers of professional and technical courses should have a profound knowledge of

the fundamentals upon which their specialities rest than that the teachers of fundamental subjects should have in mind all the important and useful applications which their subjects make possible.

I sincerely hope that my presentation has not sounded arbitrary or uncompromising. I realize that there are two well-defined schools of thought in this connection. I realize also that there possibly is no particular task which cannot be well done in more than one way. Who, then, is to say that *his* method of procedure is *the* best?

I have tried, however, to present my ideas as concretely and definitely as possible in order that they may serve as a basis for your consideration and discussion. The point involved is not a minor one. It is of fundamental importance. It is not so long ago that many schools, which are now members of this association, were giving minimum two-year and in some instances part-time, three-day-a-week courses in pharmacy. Under such conditions the question which I am now discussing did not exist. There was not time enough available for the presentation of either fundamental courses in science, or strictly technical and professional subjects. Nondescript combination courses were given, because they were the best that could be formulated under the then existing conditions.

Now, however, conditions have changed. We adopted the three-year course and then the minimum four-year course leading to the Bachelor of Science degree. With twice as much time available, should we simply devote twice as many hours to the same type of courses, or should a fairly distinct line of cleavage appear between the fundamental science courses on the one hand and the professional and technical courses on the other? My answer is that the latter procedure seems preferable.

I, of course, realize that one of the most fundamental principles of good teaching is to present a course in as interesting a manner as possible. I do not object to the *judicious* use of applications in a fundamental course in science. Good pedagogy must be served in a variety of ways and is very properly promoted by various devices and procedures. This concession, which is most willingly granted, does not, however, confuse the issue at stake or detract from the general principle for which I am arguing. I conclude, as I started, with the query: "How Should Fundamental Courses in Chemistry Be Taught in a College of Pharmacy?" I am sure you have some decidedly worth-while ideas on this subject.

Teachers of botany will find much to commend in the following paper presented by Professor C. C. Albers. The thoroughness of presentation of this phase of the work can easily be extended to other parts of the plants used in medicine and thus make the course in botany a splendid foundation for pharmacognosy.—C. B. JORDAN, *Editor*.

THE BOTANY COURSE AS A FOUNDATION FOR THE PHARMACOGNOSY OF STEM AND BARK DRUGS.

BY C. C. ALBERS.

In taking up the study of stems in a botany course, one must, of course, distinguish between aerial stems and underground stems, of which there are several types. One of the chief difficulties of and causes of confusion to the beginning botany student arises in the attempt to distinguish between underground

stems and roots, a difficulty no doubt arising from the common conception that all underground parts of the plant are roots. Nor are aerial stems always evident to him, as in the case of the prickly pear (*Opuntia* species), for example, in which case the real stems are regarded as leaves, another error very likely arising from the popular conception.

Hence, in the first place, it becomes necessary to distinguish between roots and stems, since so many of the important plant drugs consist of underground stems and roots. The differences between these two types of plant organs should then be emphasized as regards the following features: The location of the growing point, the manner of branching, the origin of the branches, buds and leaf scars, the functions of each, and finally the internal or microscopic structure of each. The majority of these differences can be pointed out in the field or in the laboratory, where representative specimens of each may be selected from the stock of drugs. A microscopical examination of longitudinal sections of root tips and stem buds will reveal the difference in location of the growing points.

So far as the underground stems are concerned, the outstanding characteristics of the four types, namely, rhizomes, corms, bulbs and tubers, should be pointed out. A textbook definition of each will scarcely be sufficient. Representative specimens of each (selected from official drugs as far as possible) should be chosen for study. In the case of rhizomes, the leaf scars and bud scales on the surface should be pointed out, as well as the rootlets on the lower surface. Johnson grass, Bermuda or Couch grass rhizomes exhibit these features excellently, as well as the jointed nature of the monocotyl type of stem. The official iris rhizome and ginger rhizomes show the irregular structure of the underground stem and also the numerous root scars (especially of iris) on the lower surface.

For the study of bulbs, the common onion, garlic or even the squill bulb may be used. The outer papery membrane of these, the fleshy scales enclosing the buds, and the roots growing from the lower end should be emphasized. The corm, on the other hand, though it is likewise enclosed in a papery membrane and is erect, short and thickened, does not consist of thick, fleshy scales, but is solid and more flattened from the top to bottom. The attention of the student should be directed to the symmetrical nature of both these types and contrasted with the lack of symmetry of the rhizomes and tubers. Since only one official drug consists of a corm and it is not readily obtainable in the unsliced form, the ordinary gladiola or crocus corm from the flower shop can be utilized.

As an example of a tuber, perhaps no better type can be found than the common Irish potato. It would be better to have an entire Irish potato plant with the tubers attached to show the manner in which the tubers are attached to long slender rhizomes. The buds or "eyes" should be carefully examined and the terminal and lateral buds noted, as well as the outer corky layer and the rows of vascular bundles internally. Finally, some scrapings from the fleshy part of each of these underground stems should be examined microscopically and the large amount of storage material in the cells noted.

So far as the microscopic structure of the stem is concerned, it would appear that this study would be even more important than the gross anatomy. Whereas the student may understand that the bark of a stem is that portion which he can "peel" off, yet without a knowledge of the structure he will have no conception

as to what constitutes a bark, no knowledge as to what plant elements are present or of the distribution of these in the bark. Nor will he understand without it just why the bark peels off so readily from the rest of the stem. Furthermore, a knowledge of the tissues present in the entire stem and their distribution will enable the student not only to understand better its functions and its general make-up but also to anticipate the elements to be encountered in examining the stem drug in powdered form. Again, the structure of the stem can be made use of in distinguishing between the various types of stems, namely, the monocot type, the dicot type and the fern type. If a distinction of the first two has been made on other grounds, it should be "clinched" by comparing the vascular bundles and their arrangement in these two types, as well as in the fern type. Nor should the comparison end here, but in the case of the dicots should be carried to those exhibiting primary and secondary structures. Then will the student fully comprehend the meaning of such terms as bark and phloem, of herbaceous and woody, of heartwood and sapwood, of periderm and borke, of cortex and cork, of cambium and phellogen, of pericycle, medullary rays, tracheids, sieve cells, collenchyma, and numerous other terms encountered in the official description of the structure of drugs derived from the stem of the plant.

The various types of vascular bundles should be studied in detail not only to ascertain the elements present and their arrangement, but also to observe what changes take place in the bundles of stems which undergo secondary growth. This change is excellently demonstrated by comparing young and old stems of *Menispermum canadense*. By this time the term "bark," defined as all tissue regions exterior to the cambium, should mean something to the student; and he should also by this time comprehend the nature of the three parts, namely, the inner, middle and outer parts, and realize why a certain bark drug is stipulated to consist of the inner bark in one case and to be "rossed," or have the "borke" removed, in another case.

For a more detailed study of a bark, Cascara Sagrada lends itself very nicely in transverse section. The three parts show up very clearly, the inner bark with its phloem elements and medullary rays, the middle bark with its cortical parenchyma and patches of stone cells, and the outer bark consisting chiefly of phellogen and cork cells.

If the above amount of detail is devoted to these plant parts in the botany course, the student should be fairly well equipped to take up a study of the drugs consisting of those plant parts.

TWENTY-FIFTH ANNIVERSARY CELEBRATION, HONORING DEAN C. B. JORDAN,* MARCH 13, 1935.

REMARKS OF ROBERT P. FISCHELIS, PRESIDENT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

To review the progress of American Pharmacy in the past quarter century in three minutes, as requested by the Committee on Arrangements, appears to be a rather formidable task. If we bear in mind, however, that the recorded history of pharmacy covers 40 centuries, it is quite obvious that the historian of the future will probably discuss this period—which looms so large in the minds of the present generation—in comparatively few words. At the rate of 3 minutes

* Purdue University School of Pharmacy.

per quarter century it would take just 8 hours of continuous talking to review the accomplishments of our profession from its beginnings in the mists of antiquity to its present status in the fogs of the New Deal.

In twenty-five years we have lived through the entire or partial administrations of six Presidents of the United States. We have lived through one of the greatest wars of history. We have baptized and buried prohibition. We have gambled our way into and out of prosperity, and through it all Pharmacy seems to have made some real progress.

A quick bird's-eye view of the situation indicates:

1. A sharp trend toward better regulation of the commerce in drugs and medicines.
2. An industrial development which, in line with other national trends, has favored the expansion of corporate interests at the expense of the small operator, and
3. A distinct elevation of our professional standards.

In 1910 only three states required pharmacists to possess a college education. The restrictions of the sales of narcotic drugs were inadequate. Restricting the sale of hypnotic drugs had hardly been thought of. Federal Food and Drug regulations were in their infancy. The Harrison Anti-narcotic Act was just in the making. To-day, after the lapse of 25 years we find two-thirds of our states requiring pharmacists to be college graduates and pharmacists urging still more stringent regulations for the control of adulteration, misbranding and advertising of drugs and with a fair prospect of obtaining them.

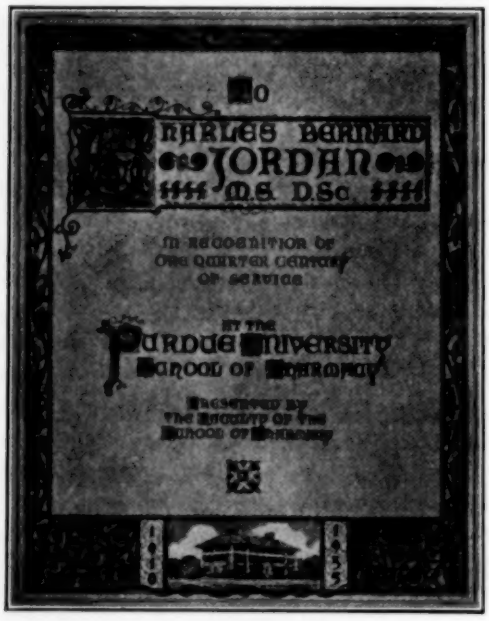
We have accomplished strict regulation of the dispensing of narcotics and there is an increasing demand for the regulation of sales of hypnotics as well as a more general public appreciation of the need for confining sales of all drugs, medicines and poisons to qualified pharmacists. The experimental work of pioneer states in this field has in many cases led to standardized national and state procedures. The closer coöperation of state and national pharmaceutical organizations is responsible for much of this progress. Monthly publications, full-time secretaries, legal advisers and specialized activities in our state and national associations are all developments of the past quarter century.

The World War gave a great impetus to the medicinal chemical industry in the United States. We are no longer dependent upon Europe for synthetic organic chemicals. The development of the machine aided and abetted by the difficulties in obtaining supplies of alcohol for manufacturing purposes on a small scale both during and since prohibition has removed much pharmaceutical manufacturing from the retail drug store. We can only marvel at the development of the manufacturing, control and research facilities of drug manufacturing corporations during the past twenty-five years, even as we regret to see the original servant of the pharmacist apparently becoming his master.

The chain-store movement in the retail drug field is largely a development of the past quarter century. While it has undoubtedly had a stimulating effect upon the merchandising activities of retail druggists, its effect on the professional side has been unfortunate for it has not only detracted the attention of retail pharmacists from their primary function but has introduced into their establishments a variety of merchandise in which they ordinarily have no interest and which has made them a target for complaint from merchants in other fields and has had a tendency to obscure their professional status in their own communities.

To combat the unfavorable developments resulting from mass production and mass distribution, leaders in pharmacy have resorted to the most formidable weapon at their command—education. To paraphrase a biblical expression, "where there is vision the people will live," and vision is the result of education. The most encouraging development in American Pharmacy during the past quarter century is the rapid increase in standards of education and licensure. From no general high school requirement for college entrance in 1910 to not less than 4 years in 1923 and from a short 2-year college course in 1910 to a minimum 4-year course on an academic basis in 1932 is the record of progress stated briefly. That this minimum educational requirement is in force now in more than two-thirds of the States of our Union and that the courses given by the American Colleges of Pharmacy have reached the high standard now obtaining is due in large measure to the foresight and determination of a relatively small group of leaders in American Pharmacy.

Right here in Indiana and on this very campus there has labored long and faithfully an individual to whom the last 25 years must have passed very rapidly and who can look back on them with considerable satisfaction.



Memorial Plaque, honoring Dean C. B. Jordan, presented by the faculty of the School of Pharmacy, Purdue University.

While turning out a new generation of pharmacists in his own college and leaving upon them the imprint of his personality and passing on to them the idealism of a noble calling, he has also for many years exercised a judicious and wholesome influence upon the destinies of pharmaceutical education throughout the United States. I need not tell you that I refer to Dean Jordan.

His services as president and later as chairman of the Executive Committee of the American Association of Colleges of Pharmacy have been of a high order. He has served the AMERICAN PHARMACEUTICAL ASSOCIATION as secretary and chairman of its Section on Education and Legislation and as vice-chairman and chairman of its House of Delegates.

It is my great privilege to bring the greetings and congratulations of the AMERICAN PHARMACEUTICAL ASSOCIATION to Dean Jordan and to Purdue University on this very enjoyable occasion and to wish for both the Dean and the University many additional years of the happy and fruitful association which has brought great credit to them as well as to American Pharmacy.

CALIFORNIA ASSOCIATION.

The 1935 convention of the California Pharmaceutical Association at Hotel Coronado, San Diego, June 23rd–26th, with the added drawing power of the International Pacific Exposition, is expected to establish an attendance record for state pharmaceutical conventions.

A Scientific Pharmacy section, a distinct innovation this year, will round out a well-balanced program of business and pleasure.

Annual Meeting of Boards and Colleges of Pharmacy, N. A. B. P. District No. 2, at the AMERICAN INSTITUTE OF PHARMACY, Washington, D. C., March 11 and 12, 1935.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

BALTIMORE.

The regular monthly meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held March 15, 1935, at the Emerson Hotel, President Wm. F. Reindollar in the chair. The minutes of the February meeting were read and approved. The meeting was then taken over by the Debating Society of the School of Pharmacy, University of Maryland. The occasion was a debate between the School of Pharmacy of the Medical College of Virginia and the School of Pharmacy of the University of Maryland. The subject of the debate was:

> *Resolved*, That the sale and distribution, at retail, of drugs, medicinal preparations and sick-room supplies be limited by law to the retail pharmacy.

For the Affirmative: School of Pharmacy of the Medical College of Virginia. Speakers: Toney Mehfud, Richmond, Va.; John Raymond Hurt, Drakes Branch, Va.; Woodrow Byrum, Suffolk, Va.; Felix Clyde Jennings, Norfolk, Va. (Alternate).

For the Negative: School of Pharmacy of the University of Maryland. Speakers: Sylvan Silverman, Milton J. Wilder, Harry Peretz, Alex Ogurick (Alternate).

The judges for the debate were Dr. Julien Gunn of the Johns Hopkins University, Hugo P. Wise of City College, and Paul Clarkson of the Legal Department of the Consolidated Gas and Electric Co., Baltimore.

Each speaker had eight minutes for the presentation of his topic with a five-minute rebuttal.

At the conclusion of the speeches the judges cast a unanimous vote in favor of the team representing the School of Pharmacy, University of Maryland, who upheld the negative side of the debate.

President Reindollar extended a hearty vote of thanks to the members of both debating teams for their efforts and congratulated the winning team.

Approximately one hundred were present with many students from the School of Pharmacy.

C. JELLEFF CARR, *Secretary-Treasurer.*

CHICAGO.

The monthly meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held March 19th, at the University of Illinois College of Pharmacy.

The speaker of the evening was Dr. John C. Krantz, Jr., Chief of the Bureau of Chemistry, Department of Health of the State of Maryland and Professor of Pharmacology at the Medical School of the University of that State. His subject was "Pharmacy in the Quest for Health."

Dr. Krantz began his discussion of "Pharmacy in the Quest for Health," by stating that disease is the arch enemy of mankind. It has haunted his every activity from the superstitious dweller in the cliffs to the occupant of the modern sky-scraper as you know him to-day.

"It can be actually said that the progress of man on this planet is the result of his efforts to beat back the ever-present menace of disease. Trace down through the centuries the discoveries that have helped to prolong life—to-day drugs that were looked upon as almost necessary in years past have given way to bacterial serums and other medicaments administered by hypodermic injection.

"Now, let us try to point out what effect these trends might have on pharmacy as we know it and as it is to be practised in the future. In most all serious illnesses we find that before long the patient is hospitalized, where he can be treated more adequately. Deliveries are performed 75% in hospitals to-day. Syphilis and malignant diseases find their way in and out of hospitals. Most of the medication carried on in the home years ago is now carried on in hospitals. There, in modern hospitals, pharmacists who devote all their time to prescriptions are able to compound a larger number than those who are working in a larger diversified field. A few pharmacists in well-equipped hospitals can do the work of many pharmacists in stores where their efforts are divided. Many pharmacists have found out that they have to make a living following more commercial pursuits rather than the profession for which they have qualified themselves.

"The trend to-day is toward simpler prescriptions, which is due to the teaching of modern pharmacology in the medical schools to prescribe simple drugs. The more complicated the prescription, the more chance of failure. Choose drugs the therapeutic value of which has been tested. We formerly believed that it was necessary to have an infusion of digitalis: now all this can be accomplished by using the powdered drug.

"I say that the stress that the Schools of Pharmacy place on incompatibilities is wasted effort. Pharmacy should say we are through with this medical mess, we are interested in the welfare of the patient and the patient's welfare is not served by complicated medicines. Don't we have some obligation to the patient? If those people practising medicine to-day do not discontinue to write incompatibilities we should take some step to stop them, and I believe it would stand as a lasting monument to Pharmacy.

"In say, 1915, the manufacturing houses began to make serious inroads into the preparation of medical products and the pharmacist has gradually drifted away from this preparation.

"We take a pharmacy, so-called, in which the pharmacy part of the store has reached the point of vanishing significance and we send a prescription to it that calls for sodium bromide, potassium bromide and strontium bromide. A copy is asked for and when wrapped with the prescription automatically becomes a part of the prescription. If the strontium bromide is left out of the prescription or substituted with one of the other bromides the pharmacist may be pros ecuted under the Pure Food and Drugs Act. The man does not realize that he is a definite part of the public health program and is not taking his work seriously.

"We sent out into the state prescriptions for one-half ounce of a saturated solution of potassium iodide. As a result we found prescriptions varying from 103% to a minimum of 55%. This means that if you were to take such a prescription to be filled your chances are even of getting an 88% solution. It should be 100%.

"Not many months ago a doctor came into the laboratory for a 1–5000 solution of silver nitrate. He said that there was only one store in the city to which he would trust the filling of the prescription. Let us say that this was uncalled for, but nevertheless it represents the attitude of the doctors toward pharmacists who are surrounded with commercial pursuits to a point where his doctor has lost faith in him.

"You might say we pharmacists only need to have the doctor on our side. A chemist wanted methylene blue for intravenous injection for a member of his family and wanted it prepared exactly right. The doctor said there is a certain druggist who can make this solution for you. The fellow threw up his hands, saying, 'I don't intend to inject it into my mother if any retail druggist has had his hands on it.' He does not picture a druggist as one interested in methylene blue. He has so diversified his efforts and energies that he cannot be interested in intravenous injection of methylene blue.

"Pharmacists have broken faith with their public health responsibility. Now, I am

interested in the public health and I am very interested in the pharmacist retaining his responsibility in the community as a public health service. Let me tell you why I think this is true and my statement is justified. Recently a preparation, a patented herb concoction, came into our community. Blazed in the headlines of the newspapers, this new preparation—for reducing—will take bile out of the liver, will relieve stomach troubles, is excellent for diseases of the bladder and has proved its worth like no other drug in kidney troubles. I take it they mean Bright's disease and arthritis. Anyone can see it is advertised for sale in all leading drug stores. Those pharmacists do not say I know this is wrong. No, they do not say this; they stock it because the profit is long, the advertising will bring sales and they become a part and parcel of that vicious system which robs a man when he is down, and I am sure that even in his most vicious moments Jesse James would not do that.

"I don't think you need a Moses. You are struggling with certain laws and with your profession, the need for which in large numbers is rapidly diminishing, and I don't think it is going to get any better. Here are my solutions: Pharmacists must be motivated by service and not by profit. We must, if we are to survive as a profession, include the science of the action of drugs in health and disease. One of our great difficulties in pharmacy has been that we have not stressed professional service to the point where we can charge for it. How much profit are we going to make on the compounding of a prescription? We should think of the drugs as insignificant and the charge should be for service. Until we get the public to realize we have a right to charge for service we cannot be looked upon as a profession, for one of the marks of a profession is that it has a legitimate right to charge for service.

"Our schools must realize, if they do not want to ruin the profession, this is no time to produce an ever-increasing number of pharmacists to practice in this none too fertile field when there is a diminishing need for them. I congratulate you that you have required one year of college work prior to entrance to your Pharmacy College.

"Do our colleges realize that they have within their power the potential means to alleviate human suffering? Do they have time for service, or are they pounded all day long by teaching, until there is not an ounce of energy left? You can see it everywhere. Research is the promised land which lies before you, my bidding is to enter into it."

LAWRENCE TEMPLETON, *Secretary.*

NEW YORK.

The March 1935 meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on Monday evening, March 11th, in the College of Pharmacy, Columbia University. About forty-five members and their guests attended.

President C. W. Ballard presided; the report of the secretary was read and approved

Chairman Robert S. Lehman, of the Committee on Education and Legislation, reported the following:

Pure Food and Drug Legislation.—Hearing on S. 5, Senator Copeland on March 2nd. A large number of persons appeared before the Sub-Committee of the Senate Commerce Committee, speaking pro and con. It is surmised that the bill will again have to be re-written: it is said that Senator Copeland will accept changes advocated by Mr. Charles Wesley Dunn.

Toilet Soaps are now under the Retail Drug Code.

H. R. 6246, Representative White, prohibits manufacturer's special rebates or discounts to chain or branch store organization.

H. R. 5062, Mapes. This bill will prevent unfair discrimination in price between different purchasers of commodities, and give the same prices to the small as the large buyer.

S. 1923, King. This bill states that it will not be unlawful for trade-code members or others to coöperate to defend themselves against unfair or deceptive practices or acts. This should enable price standardization by agreement.

S. 944, Wheeler, Federal Trade Commission Bill: Reported upon favorably by the Committee: Forbids price discrimination, and directs the Federal Trade Commission to enforce the law.

Chain Store Laws.—The West Virginia Chain Store Tax Law has been declared valid by the Supreme Court of the United States: there are now 37 chain store tax laws before the legislatures of 28 states. It is believed that most of these laws will be enacted in some form or other.

According to amendment to the Alcohol Regulations, pharmacists may purchase industrial alcohol in containers of one gallon, until April 15, 1935; after that date purchases must be in containers in excess of one gallon.

State Legislation.—Bills, Assembly No. 432, 772, Introductory No. 422: Senate No. 415, Introductory No. 398, the Fair Trade Bill (Junior Capper-Kelly Bill). This bill has a good chance of passing this session: write or telegraph your senator and assemblyman in favor of the measure.

This law has been in effect in California for over a year and has been of immense benefit to the retail trades. All manufacturers of trade-marked drug merchandise are coöperating with the retail distributor in that state.

Bills, Assembly No. 499, Introductory No. 489, Senate No. 418, Introductory No. 401: This is the Prophylactic Bill, hearing on the same on March 5th. Prospects of passing are good, but you should also write or wire the senators and assemblymen in favor. This law would limit the sale of all gynecological medicines, remedies and appliances to stores registered by the New York State Board of Pharmacy.

A bill providing for a chain store tax is before the Legislature: possibility of some legislation this session.

A bill for the enforcement of the Code of Ethics of the State Pharmaceutical Association has a good chance of being enacted. This bill provides that the Board of Pharmacy may revoke a license for unethical or unprofessional conduct, the latter to be determined in part by the Code of Ethics of the N. Y. State Pharmaceutical Association.

Chairman Steiger, of the Committee on Progress of Pharmacy, was then called upon for his report which follows:

Both the scientific sections and the advertising columns of the journals indicate an increasing interest in vitamins. Glandular products and new hypnotics are also conspicuous in the literature.

Joseph Roe in *Science* (Vol. 80, page 561) describes a color test for Vitamin C. When ascorbic acid is boiled with HCl, CO_2 is given off and furfural is formed. This can be detected by the use of aniline, phloroglucinol tests.

According to the *Oil, Paint & Drug Reporter* (March 4, page 49) Charles L. Huisking, upon returning from a trip through Europe, reports that Norway and other countries, by extensive scientific study, hope to demonstrate the superiority of pure natural Cod Liver Oil over the so-called high-vitamin oils and similar products. (*Oil, Paint & Drug Reporter*, February 25, page 46.)

Experiments conducted by the Division of Radiation and Organisms of the Smithsonian Institute, indicate that certain wave-lengths of light are specifically "poisonous" to bacteria, algæ and various parasites. These rays are found in the invisible ultraviolet between wave-lengths of 3900 and 1850 "Ångstrom units." There is extreme specificity within this range: a difference of a few Ångstroms apparently marks the difference between innocuousness and virulence for some of the lower organisms upon which the experiments have been tried.

Guiteros and Schmelkes, in the *J. of Biological Chemistry* (Vol. 107, pages 235–239) report on the compound action of sodium hypochlorite, chloramine T and azochloramide on organic substrates. The authors compare the rate of disappearance of available chlorine with various organic substrates and germicidal activity. Their conclusion is that the chloramine T is a better germicide than sodium hypochlorite, and that azochloramide is more useful than either, in the presence of organic matter.

An appeal to pharmacists to throw off the spirit of apathy appeared in the *Chemist and Druggist*, London, February 2, 1935. It formed the theme of the presidential address to the Liverpool Chemists Association on January 24th. Conditions in England are evidently similar to those here:

President Clubb, said in part: "If there is one question which has been discussed 'ad nauseam' in the pharmaceutical press it is the perennial one, 'What is wrong with pharmacy?' Every writer on the subject has fulminated against the encroachment of outside traders on our livelihood. The menace of the multiple stores (chain stores) the competition of charitable and municipal clinics, etc., are old stories." He concludes that these examples are the symptoms of a disease—"Apathy."

A communication was read announcing the date, place and tentative program for the annual convention of the AMERICAN PHARMACEUTICAL ASSOCIATION. Attention was called to the fact that a communication was received from Mrs. Jacob Diner in which she stated that Dr. Diner would be unable to attend future branch meetings and that we might remove his name from the mailing list. Action was taken upon this as follows: Dr. H. V. Arny moved that Dr. Jacob Diner be made an honorary member of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION. This motion was seconded by Mr. Lehman, voted upon and passed. The secretary was directed to write to Mrs. Diner and inform her of this action by the Branch.

Dr. Ballard then called attention to a letter which he had received from the Executive Committee of the New York Pharmaceutical Conference asking that two representatives be sent from the New York Branch to act for the Branch at an organization meeting of the New York Pharmaceutical Council, which will replace the New York Pharmaceutical Conference. In connection with this Dr. Schaefer presented the following resolution and moved for adoption. This was seconded by Dr. H. V. Arny, was voted upon and passed.

> "WHEREAS, The N. Y. State Pharmaceutical Association is inviting local pharmaceutical organizations to become affiliated with it, and
>
> "WHEREAS, The present N. Y. Pharmaceutical Conference is about to be disbanded and the N. Y. Pharmaceutical Council is now being organized under the auspices of the State Association, and
>
> "WHEREAS, All local organizations which approve of affiliation with the State Association are eligible to send delegates to the organization meeting of the new Council, be it
>
> "*Resolved*, That the N. Y. Branch of the A. PH. A. approve of the idea of affiliation with the State Association and with the new Council provided, however, that the rules of affiliation and the Constitution and by-laws of the Council as eventually drawn up will contain and include nothing contrary to the principles of our parent organization nor obligate us to any financial outlay and further be it
>
> "*Resolved*, That the president of our Branch be directed to appoint two representatives and two alternates from our membership to act for the Branch on the present Council Organization Committee."

Dr. Ballard commented on this reorganization move, saying that he favored the move since he believes that it was in the right direction in coördinating legislation activities among pharmaceutical organizations and that it ran parallel with the thoughts expressed by President Fischelis at the testimonial dinner recently held in his honor.

Fred Schaefer and Robert S. Lehman were appointed to act for the New York Branch with Hugo H. Schaefer and William C. Anderson as alternates.

This completed the business part of the meeting. Dr. Ballard then called upon the speaker for the evening, Dr. Erich Meyer of the Industrial Research Division of L. Sonneborn Sons, Inc. The complete text of Dr. Meyer's address follows:

WHITE MINERAL OIL AND PETROLATUM IN PHARMACEUTICAL AND COSMETIC PRACTICE.

BY ERICH MEYER.*

It is surprising that very little information is found in to-day's chemistry textbooks or even in handbooks on chemistry, medicine and pharmacy regarding the chemical and physical characteristics of white mineral oils and petrolatum. Rarely does one find more than just a few lines, simply indicating that such products do exist; and often such short references are rather confusing and misleading since, unfortunately, these products are known under many different and frequently misleading names. This lack of information in reference literature is the more surprising since white mineral oils and petrolatum are very important ingredients of to-day's pharmaceutical and cosmetic preparations.

Both white oil and petrolatum are crude oil derivatives. Crude oil itself is a complex mixture of a large number of different hydrocarbons. Only recently has the petroleum chemist been

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able to separate and identify a few of them. The generally accepted theory of the origin of crude oil is that which assumes the putrefaction of animal and vegetable matter under water æons ago. With the shrinkage of the earth's crust and its attendant pressure, the crude oil has been filtered through various strata as it was forced from one place to another by these phenomena.

Occurrence of Crude Oil.—To-day we find crude oil trapped in sandstone, limestone and other so-called oil-bearing formations beneath the earth's surface on almost every continent. In Asia, the best fields are found in Burma, in the Dutch East Indies, in Persia and in Mesopotamia. In Europe, crude oil is found mainly in Russia, Roumania and Poland. But the largest producer of crude oil is the North American continent. There are tremendous fields in Mexico and even larger ones in California, Texas and Oklahoma. The only field in the eastern part of the United States is the so-called Pennsylvania field.

Crude Oil of Various Types.—Crude oil can be classified as to its chemical structure into three different types, namely, naphthene base crude, paraffin base crude and mixed base crude. Naphthene base crudes are found on the Gulf Coast, in California, and in many parts of Russia. They are composed mainly of naphthene hydrocarbons of cyclo-paraffin and cyclo-olefin character. Paraffin base crudes are principally found in the Pennsylvania field. The name "paraffin base" refers to the atomic arrangement and should not be confused with paraffin wax. A paraffin base crude is mainly composed of straight chain hydrocarbons of the paraffin series. Mixed base crudes are found in the Mid-Continent field, such as parts of Texas and Oklahoma. As the name indicates, these oils contain both types of hydrocarbons.

Origin of White Oil Refining in Russia.—White Mineral Oils are refined from all three types of crude oils. According to reliable information, the present process of making white mineral oil was invented by J. Markovnikov, a Russian chemist, about 1887. In 1895 another Russian, Grigori Petroff, perfected the process to a point where it was commercially useful. Petroff undoubtedly used Russian crude because at that time the only known crude oil in Europe available for the purpose was Russian crude. A small refinery was established in Riga, then in Russian territory, and thus white mineral oils became first known as "Russian Oils." Ever since, all white oils intended for internal consumption have been commonly termed "Russian Oils" without regard to the origin of the crude or the geographical location of the refinery. Thus the term "Russian Oil" is rather the description of the refining process and not the name of a definite type of oil.

Principle of White Oil Refining.—In the refining of white mineral oils, at first the light fractions such as gasoline, naphtha, kerosene and fuel oil are distilled off. The remaining residue is further fractionated and one of these fractions represents the raw material for white mineral oil. The main object in the refining process of white mineral oils is the removal of the unsaturated hydrocarbons. These unsaturated compounds are chemically unstable and, among other undesirable features, give the unrefined oil its typical odor and taste. The refining consists principally of treating the oil with sulphuric acid, subsequent washing with alkalies followed by various filtration processes. The result is an oil which is perfectly colorless, tasteless and odorless and free from unsaturated hydrocarbons. The mere fact that an oil is colorless or waterwhite, of course, does not in itself signify that it is a completely refined mineral oil in the medical sense of the word, as it is possible to obtain a waterwhite appearance by simple filtration.

Removal of Unsaturates—an Essential.—From a theoretical standpoint it is obvious that all unsaturated compounds and other impurities must be completely removed to render the oil fit for internal use. Similarly, oil for cosmetic purposes must be free from unsaturates in order to guard against skin irritations traceable to the oil. Furthermore, it is highly desirable that a white mineral oil for cosmetic use not only should be colorless and odorless, but should remain so. It stands to reason that only a mineral oil which has been completely refined, and is thus free from unsaturates, possesses sufficient stability.

The U. S. P. Acid Test.—In order to determine to what extent the unsaturated hydrocarbons have been removed from a mineral oil, the so-called acid test is generally employed. This test established by the U. S. Pharmacopœia, is designed to show the true degree of refinement of an oil. Five cc. of the oil are heated with 5 cc. of 93% to 95% sulphuric acid in a water-bath for ten minutes and the mixture shaken at intervals of 30 seconds. Applied to partially refined oils, the acid will turn a dark yellow, brown or even black, but with a true white mineral oil the color will change only slightly.

The present U. S. Pharmacopœia specifies that a U. S. P. white mineral oil, when subjected to this test, should not become darker than pale amber. This rather vague specification was a source of many disputes in the past because no two people could agree as to what is pale amber and what is darker than pale amber. Therefore, most refiners of U. S. P. white mineral oils have developed a color scale of their own in order to enable them to express numerically the color of the acid layer.

However, upon the suggestion of H. V. Arny, the U. S. Pharmacopœia in its 11th edition (now in preparation) has finally adopted a definite color standard for the acid test by which white mineral oils refined to U. S. P. purity can be easily distinguished from those of lesser degree of refinement. This color standard, which is a combination of solutions of cobalt chloride, ferric chloride and copper sulphate of definite concentrations, seems to fulfil all the requirements to be expected from a U. S. P. standard. The various reagents are readily obtainable and are permanent.

White Mineral for Intestinal Lubrication.—One of the first physicians to recommend white mineral oil for intestinal lubrication was Sir Arbuthnot Lane. However, it was not before 1894 that first mention of white mineral oils appeared in the U. S. Pharmacopœia. To-day, the U. S. Pharmacopœia distinguishes between two grades of White Mineral Oil or Liquid Petrolatum, as it is officially designated in the Pharmacopœia: One which has a kinematic viscosity below 0.370 at 100° F. is called "light" and the other which has a kinematic viscosity above 0.381 is called "heavy." Usually, the viscosity of a white mineral oil is determined with a Saybolt Universal Viscosimeter at 100° F., and expressed in Saybolt seconds. Thus a kinematic viscosity of 0.381 at 100° F. is equal to a Saybolt viscosity at 100° F. of 175. White Mineral Oils are refined to-day having viscosities as high as 345 Saybolt seconds at 100° F.

(*a*) *Significance of Viscosity:* If white oil is used straight as such for intestinal lubricating purposes, it is advisable to specify an oil of a viscosity as high as possible because it is generally believed that the higher the viscosity the lower the tendency toward leakage.

(*b*) *Significance of Cloud Point:* A further important requirement of a white mineral oil for intestinal lubrication is a low cloud point which serves as an indication of the absence of solid paraffins which would tend to cloud and solidify the oil at low temperatures. The oil should not become more than opalescent when cooled to 0° C.

However, a cloud point caused by the presence of solid paraffins should not be confused with a cloud point caused by traces of moisture in the oil, since a trace of moisture which might be absorbed by the oil will also cause cloudiness when cooled to 0° C. Even with the greatest care it is very difficult to altogether exclude absorption of moisture, particularly in humid atmosphere, since a white mineral oil of high purity is quite hygroscopic. The absorption of minute quantities of moisture often occurs while filling the liquid into containers, though this operation may be performed with the utmost speed. Absorption of moisture also may occur when bottles of white mineral oil are left open for any length of time. A poor cloud test, due to the presence of a slight amount of moisture, is, of course, not a serious matter and therefore should be well distinguished from clouding caused by the presence of solid paraffins. For this reason, the British Pharmacopœia specifies that the oil shall be *dried* prior to determination of the cloud point. The proper procedure to dry white mineral oil is to heat the oil to 110° C. and then allow it to cool in a closed desiccator. The use of a desiccator is very important because the hot oil has a strong tendency to absorb moisture, and if left to cool in a humid atmosphere, it may absorb so much moisture that it would become cloudy even at ordinary temperature.

(*c*) *Significance of Specific Gravity:* Specific gravity also has a definite significance in judging the suitability of an oil for intestinal lubrication. Recent investigations indicate that the action of white oil in the intestinal tract is not only one of simple lubrication but it seems that white oil at the same time emulsifies with the intestinal contents, thus exerting a softening influence. Therefore, a white mineral oil of high specific gravity—a specific gravity which is as close as possible to that of water, namely, 1—will more readily emulsify than one of low specific gravity. Furthermore, information as to the specific gravity of a white mineral oil is often found helpful in determining the source from which the oil comes or the type of base of which it is composed.

(*d*) *Significance of PbO Test:* The lead oxide test, as described in the U. S. Pharmacopœia, is designated to show up sulphur or injurious sulphur compounds. It is safe to say that all white mineral oils offered for medicinal purposes show absolutely negative lead oxide tests.

Source of Crudes for White Mineral Oils.—Heavy white mineral oils are mostly obtained from

Gulf Coast and California crudes and also from Russian, Roumanian, Venezuelan and Peruvian crudes. They are composed of saturated naphthene hydrocarbons which are cyclo-paraffins of the hexamethylene type with single bonds only. So-called Russian Oil is refined mainly from Russian, Roumanian, Venezuelan and Peruvian distillates. The refining, however, is not done in Russia. Instead, the oil stock is sent to Germany and other countries for refining. Thus the term "Russian oil" is apparently a misnomer. In chemical composition white oils made from Russian and American crude are practically identical. There is no chemical test for determining the source of the oil. From the standpoint of purity, imported oils are usually equal to American oils. Usually so-called Russian White mineral oils have a lower specific gravity than American white mineral oils of the same viscosity, which is a fairly accurate method of identification.

White Oil Emulsions.—Aside from their use for intestinal lubrication, straight U. S. P. heavy white mineral oils are also employed in emulsified form. Usually, such emulsions contain about 50% to 70% of white mineral oil emulsified with water by means of acacia, agar-agar, tragacanth or similar gums. Since the use of these emulsifying agents tends to make the finished product rather heavy, a lower viscosity oil is sometimes selected. Absolute freedom from any and all impurities—even those which are not detectable by means of the acid test—is particularly essential for white oil emulsions since even traces of such foreign substances tend to partially invert the phase of the emulsion.

Nasal Sprays.—Another pharmaceutical application of white mineral oils is in the manufacture of nasal sprays and nose drops. Most of these preparations are made up with a white mineral oil of about 60 to 90 viscosity as a carrier, because it has been found that an oil of this viscosity is distributed readily through the nasal mucosa, bringing the active principles to all affected parts. Furthermore, oils of this viscosity range are tolerated even by infants. The oil should have a cloud point sufficiently low so that the finished product will not cloud at ordinary temperature. The active principles usually employed in nasal sprays include camphor, menthol, eucalyptol and thymol, as well as ephedrine salts or anhydrous chlorobutanol. These latter compounds have the property of contracting the mucous membranes, thus making breathing easier.

Baby Oils.—White mineral oils used in the preparation of so-called "baby oils" range in viscosity from 75 to 100 Saybolt seconds at 100° F. White mineral oils are preferred to vegetable oils since the latter, particularly upon exposure in a thin film, form fatty acids which tend to develop a varnish-like film and thus often have a tendency to clog the pores with consequent irritation to sensitive skins. Particular care should be exercised in selecting a white mineral oil which is as completely refined as the U. S. P. standard prescribes. Incompletely refined oils contain a varying amount of unsaturated hydrocarbons as impurities. These unsaturated hydrocarbons seem to have a definite irritating effect on the skin.

Ointments and Creams.—It is for this reason that white mineral oils of the U. S. P. purity were introduced for the manufacture of ointments, salves and creams of all kinds as, for instance, cold creams, cleansing creams and many other types. White mineral oils of U. S. P. purity are extensively used to-day for these purposes and their absolute purity, as indicated by their U. S. P. acid test, and their complete lack of odor and color have made them one of the most dependable raw materials of the cosmetic industry.

Some Essential Requirements for Cosmetic White Oils.—In determining the proper viscosity of a white mineral oil for cosmetic creams, it was found that a viscosity of about 65 to 75 Saybolt seconds at 100° F. is most satisfactory. An oil of higher viscosity lacks quick penetration and tends to make the finished cream excessively greasy. On the other hand, an oil of a lower viscosity may result in a product of thin body. One of the most important requirements of white oil in such preparations is to accomplish the liquefying of the cream not only as quickly as possible but it is equally as important that, with the help of the oil, the cream spreads evenly over the skin in a thin film.

A further interesting fact is that white mineral oils of paraffin base type are usually preferable to white mineral oils of naphthene base type in the manufacture of pharmaceutical and cosmetic creams. One of the typical differences between a paraffin base oil and a naphthene base oil is their pour points. While most of the naphthene base oils solidify at temperatures of about 15° F. to 0° F. or below 0, paraffin base oils have a much higher pour point, namely, about 25° to 50° F. The high pour point of paraffin base oils is caused by the presence of solid hydrocarbons in the oil. It appears that these solid hydrocarbons have a better affinity for those materials

which the cosmetic manufacturer adds to the oil in the course of his manufacturing process. Thus it has been found, for instance, that paraffin wax and similar materials used in cosmetic preparations blend better with a paraffin base oil than with a naphthene base oil. Therefore, as a rule, paraffin base oils give a smoother cream and the tendency toward separation of the liquid from the solid ingredients is reduced to a minimum.

As mentioned before, paraffin base oils usually can be identified by their higher pour point, and by the fact that at the same viscosity paraffin base oils have lower specific gravity than naphthene base oils.

Liquid Brilliantine.—White mineral oils are used as a base for liquid brilliantines. A low viscosity oil—about 50 to 75—is generally employed for this purpose and perfume and coloring material are added. For some time past it had been conceived that an ideal oil base for brilliantines should consist of white mineral oil of non-volatile characteristics, combined with a mineral oil of volatile characteristics. When using such a combination on the hair, the volatile portion of the mixture would evaporate in a short time, leaving an exceedingly thin and continuous film on the surface, thus eliminating stickiness and greasiness. The volatile characteristics of a hydrocarbon distillate of the type of kerosene would be satisfactory as a volatile ingredient of such oil combination. However, the use of ordinary kerosene was strictly limited because of its strong characteristic odor which cannot be easily concealed. Furthermore, the unsaturated hydrocarbons contained in unrefined kerosene are likely to cause a burning sensation and in many cases more or less acute dermatitis.

With the development of a completely refined kerosene, it is now possible to prepare an oil base along the lines just mentioned. These fully refined hydrocarbon distillates possess all the useful properties of ordinary kerosene, but, apparently, none of its drawbacks. Measuring these oils, which in fact are the lowest viscosity white mineral oils, by U. S. P. standards, the acid test conforms to the U. S. P. specifications although, of course, they cannot be classified as U. S. P. white mineral oils. The absence of kerosene odor in these completely refined, light hydrocarbon distillates extends their range of usefulness in connection with the manufacture of a large variety of cosmetic products.

Suntan Oils.—Another application of white mineral oils is as a carrier in the preparation of so-called suntan oils. These preparations are used for protecting the skin against the excessive action of the sun's rays. Such preparations contain an active ingredient which absorbs the actinic rays and so prevents too severe action on the skin. Sometimes, a small percentage of almond oil, castor oil or similar vegetable oil is added to the white oil in order to increase its adhesion.

Non-Drying Characteristics.—A small percentage of white mineral oil (up to 4%) has been found helpful in the manufacture of vanishing creams because it tends to prevent the stearic acid from drying out. Incidentally, this same principle is often applied in the manufacture of tooth paste. A small percentage of white oil seems to satisfactorily overcome hardening of the tooth paste in the tubes, particularly those shipped to hot countries.

Allied Cosmetic Uses.—White oils are used as softening agents in the manufacture of brushless shaving creams, soaps, nail polish removers and in various other softening preparations. They are used in numerous hair tonics and skin tonic lotions. In all these cosmetic applications and in many others not mentioned here, the inactivity of fully refined white mineral oils to chemical reaction, their freedom from odor and color and their relative stability toward light, heat and aging are among the most important reasons for their usefulness in this industry.

PETROLATUM—ITS COMPOSITION:

Petrolatum is closely related to white mineral oil. However, in contrast to white mineral oil, which consists mainly of hydrocarbons, liquid at ordinary temperature, petrolatum is composed of solid and liquid hydrocarbons, solid at ordinary temperature. There is also a close relationship between petrolatum and paraffin wax, but in contrast to paraffin wax which forms crystalline aggregates, petrolatum is amorphous. We can imagine that petrolatum is a colloidal system in which the solid wax is the external phase, and the oil the internal phase. In other words, the wax absorbs the oil just as gelatin does water, causing the formation of a swollen jelly-like mass. This explains the fact that petrolatum in its concentrated form will not leave an oily spot on paper, showing that the wax is the external phase. For a system to form in this manner, and not have

the liquid separate from the solid hydrocarbons in time, a third component is necessary. This substance acts as a gel-former and is called proto-substance.

This proto-substance can be separated from the petrolatum by extraction with acetone. The proto-substance is insoluble in acetone and is then separated from the residue by dissolving it in pure Benzol.

Importance of Proto-Substance.—Proto-substance is present in satisfactory quantities in natural petrolatum. However, it is very often removed in the refining process and is not present in synthetic petrolatums. An insufficient amount or a complete lack of proto-substance upsets the balance of the solid and liquid components of the petrolatum and, as a result, such petrolatum has a tendency to separate and cause the objectionable "sweating." Therefore, the presence of an ample amount of proto-substance in a petrolatum is absolutely essential. In addition, proto-substance appears to contribute to the emollient or soothing properties of petrolatum. In order to preserve the proto-substance, no drastic methods, such as intense heating or strong chemicals, should be employed in the refining of the petrolatum.

Refining Methods.—Petrolatum is obtained only from paraffin base (Pennsylvania) and Midwestern (mixed base) crudes. The reason for this is that the still residue obtained from naphthene base crudes gives an asphalt-like material when further refined, from which it is practically impossible to extract any crude petrolatum.

In the refining of the U. S. P. petrolatum, the crude petrolatum is purified by a process technically known as adsorption. This, in principle, consists of bringing the crude petrolatum in contact with very porous materials, such as fuller's earth, bone-black, etc. The fine pores of the filtering material remove from the crude petrolatum all the impurities which give it color, odor and taste. The more often the purification process is repeated, the lighter will be the color of the petrolatum. Hence, the color range of petrolatum from amber to snow white.

The adsorption process is lengthy and tedious. Sometimes more rapid methods, such as treatment with strong chemicals, are used for refining petrolatum. By such methods, very light colors can be obtained, but it is often done at the sacrifice of the quality of the petrolatum because such chemicals destroy the proto-substance present in the natural petrolatum. Such petrolatums in reality are thin liquids held together by an excess of wax.

Variation in Fibre Characteristics.—It is often the belief of the pharmaceutical and cosmetic chemist that petrolatum is just petrolatum and that almost any petrolatum will do for a given purpose, as long as the color is about right. However, petrolatum is not such a simply defined product, but one which exists in a variety of different types. There are certain types of petrolatum of excessively long fibre characteristics which tend to make the finished product too sticky or stringy. The type of petrolatum used for most pharmaceutical and cosmetic preparations should be of ***medium*** but not short fibre. A very short fibre petrolatum is undesirable for most pharmaceutical and cosmetic uses since it is apt to result in a product of thin body, and it also lacks the smooth salve-like consistency of petrolatum of medium fibre characteristics. Shortness of fibre is usually found in synthetic petrolatums and in petrolatum refined by chemical treatment.

In selecting the proper type of petrolatum for a given purpose, two further important properties should be considered, namely, melting point and consistency. These two properties of petrolatum are entirely independent of each other. In other words, a petrolatum can have a high melting point coupled with soft consistency, medium consistency or hard consistency.

Melting Point.—While melting point is admittedly a consideration, its importance is often overestimated. The melting point of the finished product should be high enough to preclude its liquefying at summer temperatures. However, there is no additional advantage derived from the use of a petrolatum having a melting point higher than that.

Consistency Tests.—Correct and uniform consistency is one of the most important factors in determining the suitability of a petrolatum for a given purpose. The consistency of petrolatum can be determined with an instrument similar to the asphalt penetrometer. The principle of this method, which has been adopted by the American Society for Testing Materials, is to determine the distance a steel cone penetrates under its own weight into the petrolatum. The softer the petrolatum, the deeper will the cone penetrate into it during a given time.

There is a still more sensitive method, the principle of which is to determine the time in seconds it takes for a plunger of lighter weight than that used in the A. S. T. M. method, to sink 1 inch into the petrolatum. This method is very accurate, because a very slight variation in con-

sistency of the petrolatum already causes a big difference in the time it takes for the plunger to penetrate 1 inch. Correct and uniform consistency of petrolatum is considered to-day one of the most important characteristics of petrolatum.

Petrolatum Classifications.—U. S. P. petrolatum can be divided into three distinct types, according to melting point and consistency. Each type can then be subdivided according to color into individual grades.

Type No. 1 includes those petrolatums which have medium melting point and medium consistency. Type No. 2 are petrolatums of low melting point and soft consistency and, finally, Type No. 3 are petrolatums of high melting point and medium consistency.

The petrolatums of medium melting point and medium consistency—type No. 1—are the standard petrolatums of commerce and are used in largest volume. They are best suited for use in pharmaceutical salves, cosmetic creams, hair dressings, etc. Petrolatum of this type has a melting point of about 115–120° F. and is produced in different colors ranging from amber to an almost pure white.

Petrolatum of low melting point and soft consistency—type No. 2—is particularly recommended for repackaging in jars or tubes for resale as petroleum jelly for household use where a soft easy spreading consistency is desirable. It should be employed as the petrolatum base when a large amount of solid ingredients are to be added. This type of petrolatum, however, is not recommended when a large amount of liquid ingredients, such as white mineral oils, are part of the formula. The soft consistency and rapid liquefying properties of this petrolatum (which has a melting point of about 105–110° F.) makes it particularly suitable for salves of all kinds. It is often referred to as collapsible tube grade or ointment grade.

Type No. 3 (which has high melting point and medium consistency) is required only in those cases where the addition of liquids would otherwise reduce the melting point of the finished product to an undesirable degree. The melting point of these petrolatums is in the range of 125–130° F.

There is a fourth type of petrolatum characterized by high melting point and hard consistency. The usefulness of such petrolatum which has a melting point of about 130–135° F. is limited, though there are certain applications for it in the cosmetic industry, as for instance, in the preparation of lip and paste rouges, etc., which should not be overlooked.

Selection of Correct Petrolatum Type.—In making up any preparation in which the use of petrolatum is desirable or essential, it is necessary to investigate which type of petrolatum is best suited for a given purpose. Only in this way can the fullest benefit be derived from the use of petrolatum.

For example, in the formula for zinc oxide ointment, the Pharmacopœia simply specifies White Petrolatum, which means any U. S. P. petrolatum of a color of lily white or lighter. However, the 20% zinc oxide which is to be added to the petrolatum tends to stiffen up the finished ointment. Therefore, a petrolatum of soft consistency should be used for this purpose, because it will compensate for the stiffening action of the zinc oxide. As another example, in a phenol ointment, which should not be too soft, a petrolatum of medium consistency and medium melting point is the proper type to use. In the Pharmacopœia X, the hardening of an ointment was accomplished by specifying the use of paraffin wax or beeswax, whereas for softening purposes, the addition of white oil was prescribed. This procedure is not ideal. By adding a relatively large amount of paraffin wax or beeswax, the structure and appearance of the ointment is unfavorably affected and it will not spread smoothly and evenly whereas the addition of oil may result in separation and "sweating."

It is gratifying to note that the U. S. Pharmacopœia is recognizing the progress made in petrolatum refining by their proposed change of the official ointment formulas in the new Pharmacopœia. When these changes go into effect, petrolatum will not only take the place of benzoinated lard in all those formulas, which still prescribe its use, but the pharmacist will be able to modify a given formula in such a way as to employ the type of petrolatum which requires the least amount of wax for hardening and the least amount of oil for softening. This also will enable the pharmacist to prepare ointments which will not be too soft in warm climates or too hard in cold climates. The empiric system of formulating many pharmaceutical and cosmetic preparations is always wasteful. Trial and error can be avoided, once the function of a white mineral oil and petrolatum in a specific formula is understood.

At the close of the speaker's address members in the audience asked several questions regarding the use of kerosene oil in cosmetics and the use of petrolatums. At the close of the discussion a rising vote of thanks was accorded the speaker for his very interesting and instructive talk and the meeting adjourned.

RUDOLPH O. HAUCK, *Secretary.*

PHILADELPHIA.

The March meeting of the Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION, was held at the Philadelphia College of Pharmacy and Science March 12, 1935, with Vice-President Miller presiding.

The occasion of the evening, previous to the meeting, was that of the annual dinner tendered by the members of the branch to its past-presidents in honor of their loyalty to the organization.

Before seating the party, Vice-President Miller requested a period of silence in memory of the former presidents who, during the past year, answered their last call.

The following past-presidents were in attendance, and each was called upon, by the chair, for a word of greeting and a few appropriate remarks: W. A. Pearson, E. Fullerton Cook, Ambrose Hunsberger, J. W. E. Harrisson, Adley B. Nichols, Marin S. Dunn, James C. Munch, Wm. J. Stoneback and Frank H. Eby. The remarks for the most part dealt with brief historical sketches of the association. After the dinner the members of the branch and guests assembled in the college auditorium for a business session.

The minutes of the last meeting were read and approved.

The treasurer's report was submitted with certificates of audit as rendered by Wm. J. Stoneback. The report showed a balance of $155.79 plus a 10% payment from the closed Mutual Saving Company, which is placed in a separate saving fund. On motion duly seconded and carried the report was accepted.

The resolution upon the death of William L. Cliffe was read, adopted and spread upon the minutes.

Vice-President L. L. Miller than introduced Dr. J. W. E. Harrisson as the speaker of the evening. He gave a very interesting and informative lecture on the proposed legislative measures before the Federal government, namely, the Meade and the Copeland bills. Dr. Harrisson very thoroughly and clearly gave a tabulated summation of the chief similarities and dissimilarities between the two bills and enumerated the complexities of certain phases of each bill. A short discussion followed the address, after which Ambrose Hunsberger presented the following resolution:

TO THE CONGRESS OF THE UNITED STATES.

WHEREAS, it has become apparent that in order to afford adequate protection to the consuming public against fraud and deception the Food and Drugs Act now in effect needs to be expanded and strengthened, and

WHEREAS, several bills have been introduced into the Congress which are designed to achieve the above purpose, therefore

Be it resolved by Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION, in regular meeting assembled that we endorse any legislation which provides adequate protection against the distribution of substandard or adulterated Foods and Drugs, and

Be it further resolved, that such legislation should provide methods for preventing and exploitation of Foods, Drugs and Cosmetics by false misleading, and deceptive advertising in whatever form, and

Be it further resolved, that such legislation should require statements on the labels of containers setting forth the identity and percentage of the potent ingredients contained therein, and

Be it further resolved, that enforcement of the foregoing and all other provisions of Food and Drug Control enactments should be placed under the jurisdiction of the Food and Drug Administration in the Department of Agriculture.

Respectfully submitted,
Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION.

E. H. MacLaughlin, *President.* G. E. Byers, *Secretary.*

Said resolution to be placed on our records and a copy mailed to the proper authorities for delivery to the Federal Committee on said bills. Motion was seconded, accepted and so ordered.

A rising vote of thanks was then given to Dr. Harrisson for his timely lecture.

Chairman James C. Munch, of the Nominating Committee, reported a list of officers for the coming year. The nominees were duly elected; they are: *President*, Edmund H. MacLaughlin; *First Vice-President*, L. L. Miller; *Second Vice-President*, John N. Woodside; *Secretary-Treasurer*, George E. Byers; *Delegate to the House of Delegates*, Ambrose Hunsberger.

GEORGE E. BYERS, *Secretary*.

STUDENT BRANCH OF ST. JOHN'S UNIVERSITY COLLEGE OF PHARMACY.

The regular meeting of the Student Branch of St. John's University College of Pharmacy, A. PH. A., was held January 28th, President Arancio presiding. The minutes of the previous meeting were read and approved. The several committees presented their reports. Chairman Matz, of the Committee on Program, presented Mr. Bellafiore, the first speaker for the evening, who discussed "The Pharmaceutical Possibilities of Dental Supplies," taking as a source for his material an article published in the last issue of the JOURNAL A. PH. A. He recalled the coöperation between doctor and pharmacist of some years ago when pharmacists detailed doctors with suitable official preparations which the doctors subsequently prescribed.

This was to their mutual benefit, he said, "the doctor being assured of therapeutically active medicines and the pharmacist in being able to dispense standard non-proprietary preparations. The dentist who to-day buys proprietaries through dental supply houses is often lured into using harmful products or products which masquerade under meaningless descriptive terms and whose true worth cannot be determined. The pharmacist can not only protect him from these impositions but can replace these items with official products at lower prices." Mr. Bellafiore concluded by mentioning several official substances that can be offered to the dentist; among them were Mercury, Tincture of Iodine, Eugenol, Liquefied Phenol and Compound Dental Liniment of Aconite.

The next speaker was introduced by Professor Corcoran as Charles Harland Simpson, Jr., official representative of the United States Public Health Service. His subject was "Pharmacy in Public Health Service." Mr. Simpson outlined to an interested audience the growth of the service from 1798 when it was first established as a hospital for the care of seamen to its present indispensable activities in safeguarding the health of the nation.

"To-day the Service consists of seven divisions headed by the Surgeon-General of the Public Health Service who is in turn under the jurisdiction of the Secretary of the Treasury. The names themselves indicate the functions of the various divisions: Division of Research, Marine Hospitals, Mental Hygiene, Venereal Disease, Domestic Quarantine, Reports and Vital Statistics, Foreign and Insular Quarantine."

"Modern means of transportation," Mr. Simpson pointed out, "both inter-state and international, can spread disease so rapidly that rigid inspection and quarantine are absolutely essential. For example, some one who had contracted a disease in some South American port would develop the symptoms of the disease in the two weeks on ship-board whereas to-day he is deposited in our country by plane in a few days before the disease has had time to make its appearance. Then again trains carrying milk, water, passengers, etc., within our borders have to be watched. To control these modern conditions the Division of Reports and Vital Statistics has available the condition of health of cities, states and nations so that inspectors know whence to expect disease.

"The service is quick to investigate health problems. For example, its Research Division discovered the poisonous properties of knockless gasoline and prevented its use as a dry cleaner. It traced to oysters grown in unsanitary beds an outbreak of typhoid in Chicago and caused legislation to be passed that oysters may be grown only in inspected beds. Its work eradicated amœbic dysentery and encephalitis almost completely.

"In 1929 Narcotic Farms were established where drug addicts are sent for a cure which consists largely of gradual withdrawal of the drug and instruction in personal hygiene. This led to the formation of the Division of Mental Hygiene which in addition cares for morons and Federal prisoners.

"Lepers are sometimes discovered in this country. Without publicity these are withdrawn to hospitals where they are treated. The Service provides standards for biologicals and vaccines. It inspects immigrants. It controls the proper neutralization of arsphenamine.

"Pharmacists perform an important part of this work. After a preliminary training, they are named administrative heads of Marine Hospitals, direct crews in fumigating ships from diseased ports to kill rats or act in their professional capacity. They are admitted to the service only with a B.S. in Pharmacy degree after passing written and oral examinations in academic, business and professional subjects.

"The Service is the first part of our Government to recognize the pharmacist with a Commission. Pharmacists will act as administrative coördinators throughout the country in the proposed social security program."

At the conclusion of his talk Mr. Simpson was given a vote of thanks.

ADA J. BIZZARRI, *Secretary.*

PROGRAM.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.*

PROGRAM—SECTION N (MEDICAL SCIENCES). SECTION N3 (PHARMACY).

Thursday, June 27, 1935, 10:00 A.M. to 12:30 P.M.[1]

John C. Krantz, Jr., Councilor—to the American Association for the Advancement of Science from the AMERICAN PHARMACEUTICAL ASSOCIATION—Presiding.

Gustav Bachman, Councilor—to the American Association for the Advancement of Science from the AMERICAN PHARMACEUTICAL ASSOCIATION—Local Secretary.

The assignments are 15 minutes for each presentation.

1. "Studies on the Penetration of Antiseptics in Living Tissues." By Arthur D. Hirschfelder and Milan Novak, Department of Pharmacology, School of Medicine, University of Minnesota.

2. "A Study of *Cracca Virginiana L.*" By Lawrence F. Madland and Arthur H. Uhl, Department of Pharmaceutical Chemistry, University of Wisconsin.

3. "Colloidal Properties of the Arsphenamines in Relation to Toxicity and Therapeutic Efficiency." By Harold N. Wright, Department of Pharmacology, School of Medicine, University of Minnesota.

4. "The Fate of the Sugar Alcohols and Their Anhydrides in the Animal Body." By John C. Krantz, Jr., C. Jelleff Carr and Ruth C. Musser, Department of Pharmacology, School of Medicine, University of Maryland.

5. "The Application of the Shaffer-Smogyi Method in the Study of the Deterioration Rate of Tincture of Digitalis and a Physical and Pharmacological Investigation of the Absorption of Glucosidal Complexes Present in Tincture of Digitalis." By Earl B. Fischer, R. A. Gortner and Charles E. Rogers, Department of Pharmacy and Biochemistry, University of Minnesota.

6. "The Microscopy of Powdered Desiccated Endocrine Glands." By Heber W. Youngken, Department of Pharmacognosy, Massachusetts College of Pharmacy.

7. "A Physicochemical and Pharmaceutical Contribution to the Solubility of Boric Acid in Water." By George Grossen and Gustav Bachman, Department of Dispensing, College of Pharmacy, University of Minnesota.

8. "The Effect of Certain Sugar Alcohols and Their Anhydrides in the Disassociation Constant of Boric Acid." By Margarethe Oakley, C. Jelleff Carr and John C. Krantz, Jr., Bureau of Chemistry, State of Maryland Department of Health, and Department of Pharmacology, School of Medicine, University of Maryland.

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* Minneapolis, Minnesota.

[1] Meeting Room to be announced later.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1934–1935.

Office of the Secretary, 2215 Constitution Avenue, Washington, D. C.

LETTER NO. 13.

February 4, 1935.

To the Members of the Council:

71. Meeting of the Executive Committee. Upon the call of Chairman Hilton a meeting of the Executive Committee of the Council was held at 2215 Constitution Avenue, Washington, D. C., on Saturday, January 5, 1935, to consider the following matters and any other business that should properly come before the Executive Committee:

Report of the Special Committee to confer with a Special Committee from the N. A. R. D.
Relation of the A. PH. A. to the National Drug Trade Conference
Report of the Committee on Maintenance
Report of the Committee on Publication—National Formulary, Recipe Book, Pharmaceutical Abstracts
Representation of the A. PH. A. on the National Retail Drug Code Authority.

The minutes of the meeting are as follows:

The meeting was called to order by the Chairman at 10:20 A.M. with the following members present: Arny, DuMez, Dunning, Eberle, Fischelis, Hilton, Holton, Kelly, LaWall and Philip. Chairman Hilton stated that J. H. Beal as vice-chairman of the Council and R. L. Swain as a member of the A. PH. A.-N. A. R. D. Joint Committee, had been invited to attend the meeting—Dr. Swain was present at both sessions and Dr. Beal attended the afternoon session.

Messrs. Fischelis, Swain and Kelly submitted a verbal report as the A. PH. A. representatives on the A. PH. A.-N. A. R. D. Joint Committee and the following minutes of the first meeting of the Joint Committee and requested that they be given any instructions thought advisable with respect to the several subjects under consideration by the Joint Committee:

The first meeting of the Joint Committee representing the A. PH. A. and the N. A. R. D. was held at the Hotel Washington, Washington, D. C., on Wednesday, December 5, 1934, beginning at 8:15 P.M. The meeting was postponed from Tuesday, December 4, 1934, because Mr. Dargavel found it impossible to be present.

All members of the Joint Committee were present: Charles Ehlers, John W. Dargavel, Thomas S. Smith for the N. A. R. D., and Robert P. Fischelis, Robert L. Swain and E. F. Kelly for the A. PH. A.

By agreement Robert P. Fischelis acted as chairman and E. F. Kelly as secretary.

After an interchange of greetings, the Joint Committee proceeded to a consideration of the matters referred to it by the annual meeting of the Council, A. PH. A., and the Executive Committee, N. A. R. D.

After a lengthy discussion of the relations between the two Associations and between them and the State Pharmaceutical Associations, during which particular attention was given to the membership of the three groups, to the formation of Conferences of State Associations, and to the necessity for unifying the forces of the three groups, and providing for the effective representation of pharmacists, it was unanimously agreed:

1. That the proposal to consolidate the A. PH. A. and the N. A. R. D. was disposed of for the present by a formal resolution adopted by the N. A. R. D. at its recent meeting in New Orleans.

2. That, although the proposal for some form of affiliation between the two Associations did not appear to be practical under the existing conditions and in view of the apparent need for separate organizations to deal with the professional and economic problems of pharmacy, an effective plan of coöperation should be worked out.

3. That some practical plan of federating the State associations with the A. PH. A. and the N. A. R. D. more closely than is now the case is necessary.

4. That the Committee favors the further consideration of the suggestion that a plan be worked out for federating the State associations with both national associations by providing that members of each State association become automatically members of the national associations on a single membership fee plan.

Arrangements were made for a meeting of the Joint Committee early in January, pref-

erably on the 8th, to further develop the plan to which representatives from the Conference of Pharmaceutical Association Secretaries, representing the State associations, will be invited.

With respect to Pharmacy Week, it was agreed:

1. That the A. PH. A. should take the leadership and should appoint the Committee on Pharmacy Week including several representative members of the N. A. R. D.

2. That the two Associations should award a joint certificate to the ten best window displays after the first award.

3. That the annual appropriations of $250.00 each from the A. PH. A. and N. A. R. D. be continued and increased as rapidly as possible.

4. That as many carefully selected advertisers as possible be requested to give a definite time for Pharmacy Week on the radio and to provide them with a program.

After a general discussion of U. S. P. and N. F. Publicity, it was the sense of the Committee that the A. PH. A. should direct this effort and that it should collect information about the work being done in the various States and work out a standard plan for promoting the use of official preparations.

It was agreed that First Aid Week should be directed by the N. A. R. D., and that the A. PH. A. should assist in so far as possible.

The meeting adjourned at 11:00 P.M. to meet at 10:00 A.M. on December 6th, with the understanding that the chairman and secretary would prepare for consideration at that time, a statement to be sent to the pharmaceutical press.

The meeting reconvened at 10:00 A.M. on December 6th, with all members present except R. L. Swain.

After several changes were made, it was agreed that the statement, of which a copy is attached, should be issued by the secretaries of the two Associations.

The meeting then adjourned.

The forenoon session was devoted to a discussion of federation and of joint membership in the A. PH. A., the N. A. R. D., and the State associations on a single membership fee or otherwise. A letter that Dr. Dunning had addressed to the secretary, on this subject, was read and it was requested that a copy of it be sent, with these minutes, to each member of the Council. President Fischelis explained his plan for federation and joint membership on a single membership fee and stated that this plan would be given in his address to be delivered at the testimonial dinner to him in New York on January 10th.

After all present had expressed their views, it was agreed that the representatives of the A. PH. A. should attend succeeding meetings of the Joint Committee with an open mind on the subject and should coöperate in the investigation and consideration of any proposed plan for federation on a single membership fee or otherwise, for submission to the respective associations.

Adjournment was taken at 1:00 P.M. for lunch and the afternoon session was called to order at 2:10 P.M.

72. Committee on Maintenance. Chairman Dunning submitted a verbal report that the sum of $109,568.00 has been subscribed to the Maintenance Fund of which $61,707.00 had been paid. Of this total $50,000.00 was in the form of a bequest by will. The subscriptions to this fund were being segregated from those to the Headquarters Building Fund with the exception of one cash subscription of $50,000.00, the donor of which had specified that it might be used for paying off any indebtedness on the building and equipment. All indebtedness including the note for $40,000.00 with the Maryland Trust Company has been paid, leaving the project entirely free of debt excepting a balance of $1000.00 due on the planting, and with a cash balance of about $10,000.00. The mortgage of $36,400.00 on Lot No. 7, which Lot the ASSOCIATION had found it necessary to buy in order to secure Lots Nos. 12, 13, 14 and 15 from the George Washington University, could be continued at 5½% or might be refunded for an indefinite period at 4½%. This mortgage was amply protected by the bequest referred to above.

Chairman Dunning said that the work of his Committee would be continued as opportunity presented and requested assistance in securing funds for special purposes such as the library, museum, etc., and for special services that could be carried on in the building.

In reference to the exemption from taxation, Dr. Hilton reported that although final action had not been taken by the Board of Commissioners due to the recent change in administration, he had been assured that the matter would have attention at an early date.

Chairman Dunning reported that he and the secretary had given consideration to the suggestion made at the meeting of the Executive

Committee on July 17th, that special committees be provided to coöperate in connection with the Library and the Museum. As the Council was charged with the custody of the property, funds and publications of the ASSOCIATION, it appeared to be the duty of the Council to select these committees and to decide on their duties. After a general discussion, it was moved by Kelly that a special Committee on Library and a special Committee on Museum be created by the Council, membership not to be limited to the Council and to be selected with special reference to their knowledge and experience, to study the development of the library and museum, respectively, and to submit plans with respect to each. The motion was seconded by Holton and carried. It was moved by Arny that the members of these Committees should be chosen by nomination and vote of the Council. The motion was seconded by Fischelis and carried.

On motion of Holton-Arny, the report of the Committee on Maintenance was received with thanks to Chairman Dunning for his services.

73. Committee on Endowment. Chairman Beal reported that he had contributed $1000.00 to this fund in 4% bonds, that the bonds would be delivered at an early date and that efforts would now be made to further increase this fund. The report was received on motion of Holton-Kelly, with thanks to Dr. Beal for his contribution.

74. Relation of the A. Ph. A. to the National Drug Trade Conference. Referring to recent discussion of this subject, Dr. Beal, who was at that time general secretary of the ASSOCIATION, reviewed the actions leading to the establishment of the Conference and to the purposes which it was intended to serve. It was not expected that there would be unanimity of opinion or of action with respect to all matters brought before the Conference but that there would be friendly consideration of them and coöperation on those which were found to be of mutual interest. Although there had been criticism of the Conference and of its work, he felt that it had served and could serve a useful purpose in providing a meeting ground for the member associations, representing every division of pharmacy and the drug trade, as had been intended by the A. PH. A. in proposing the Conference.

A lengthy discussion followed with particular reference to the last annual meeting of the Conference and the position of the A. PH. A. on matters which the Conference was now dealing with, notably Food and Drug Legislation. No action was considered to be necessary.

75. Committee on Publications. Chairman DuMez said that the Committee was now faced with several questions which could not be satisfactorily considered and decided by correspondence.

With respect to the *National Formulary, VI*, the work of revision was nearing completion, the contract for printing and binding has been awarded and page proofs were now being distributed. Recommendations had been made by his Committee to the Council that invitations for bids on the distribution and sale of the N. F. VI be issued to a selected list of firms under specifications and proposal as submitted and that the retail selling price be set at $5.00 per copy in buckram and at $7.00 per copy in leather (see Council Letter No. 8, pages 1245 and 1246). Although these recommendations had received the approval of a majority of the members of the Council, some objection had been voiced to the proposed price of $5.00 for the N. F. VI in buckram. The reasons for the suggested increase had been given in Council Letter No. 8, and were reviewed.

After a full discussion of the question, the vote on Motion No. 12 by which the retail selling price of the N. F. VI was set as $5.00 per copy in buckram and at $7.00 per copy in leather and the retail selling price of the *Pharmaceutical Recipe Book* was set as $5.00 per copy in buckram was confirmed, on motion of Philip-Holton. Dr. Fischelis asked to be recorded as voting "No" on the price of the N. F. VI in buckram.

With respect to the *Pharmaceutical Recipe Book*, Chairman DuMez reviewed the progress of the revision and explained the difficulties that were being met with and the steps being taken to deal with them. It was not intended to issue the second edition until after the appearance of the U. S. P. XI and the N. F. VI. The contract for printing and binding R. B. II had not been let as it is not yet known how many of the present plates can be used again. The arrangements that had been made with Mrs. Kassner to act as Editor of the second edition were also explained. Mrs. Kassner had undertaken to complete the work under the direction of Chairman Lascoff as far as possible before her return to England late in February and to attend to the remainder by

correspondence, and desired to leave the matter of payment for decision after the work was done.

Chairman DuMez stated that at a conference with Chairman Lascoff and Secretary Kelly, it had been decided that a meeting of the full Committee on Recipe Book would not be required but that a meeting of certain members would be necessary later. It was believed that the expenses of this meeting and other incidental expenses would be covered by the present appropriation of $500.00 in the budget and that $500.00 should be added to the appropriation to cover the cost of editing. On motion of DuMez-Arny, $500.00 was added to appropriation for the *Recipe Book* in the 1935 budget.

With respect to the *Publication of Changes in the N. F. VI*, Chairman DuMez submitted parts of the report covering the changes as prepared by Chairman Gathercoal and explained the estimated cost of publishing the entire report. After a general discussion it was moved by Philip that while greatly appreciating the fine work done in preparing the abstracts of the proposed changes in the N. F. VI, the Council believes that in the present financial condition of the ASSOCIATION, the large expense that will be necessary in printing these changes and the small amount of space available in the JOURNAL, makes the publication impractical at this time. The motion was seconded by Arny and carried.

With respect to the *Publication of Abstracts in the A. Ph. A. Journal*, Chairman DuMez reviewed the recommendations made by the Special Committee on YEAR BOOK in 1933 and which were referred to the Committee on Publications for action, and stated that the latter committee was arranging to publish the abstracts for 1935 in the JOURNAL beginning with the March issue. They would be printed in forms of 32 pages separately numbered and following "Editorial Notes" in order that these pages could be removed for separate binding if desired. The ASSOCIATION data and roster of members can be printed in one issue of the JOURNAL and it is planned to have several hundred of the YEAR BOOKS bound in the present style for sale to libraries and others interested in continuing the series. This would provide a total of 384 pages per year for abstracts which approximates the number of pages used in the YEAR BOOK. It is proposed to pay the abstractors at the rate of $2.00 per page in English and $3.00 per page for other languages. On motion of LaWall-Arny, the Committee was authorized to proceed with the publication of abstracts in the JOURNAL on the plan proposed.

Following the meeting of the Executive Committee, Chairman DuMez wrote that in order to have a complete record, he would submit the plan for publication of the abstracts, as outlined on page 45, to the members of the Committee on Publications and has advised that the following has been approved by the Committee:

"Several years ago the Council of the A. PH. A. appointed a Special Committee on YEAR BOOK, at my request, to make recommendations with respect to the nature and number of articles to be abstracted and with respect to the future disposition of these abstracts. There has been a demand which has become more and more urgent in recent years that these abstracts be made available to the members much sooner than they have been in the past.

"This Special Committee made a careful study of the situation and rendered a written report to the Council on two consecutive years. The second report made certain definite recommendations, among which was that the abstracts should be published monthly in the JOURNAL. The Council approved this recommendation and authorized the Publication Committee to put it into effect just as soon as the affairs of the ASSOCIATION would permit. We are now ready to carry out these recommendations and the essential details of the plans which have been made for doing so and which are now submitted to you for approval are as follows:

"1. The abstracts will be carried as a section in our JOURNAL, immediately following the editorial notices and preceding the advertising section. The pages of this section will be numbered separately so that they can be taken out from the other material, combined with the ASSOCIATION data and the indices to make what would be essentially the YEAR BOOK as we now know it.

"2. In making the new contract for the publishing of the JOURNAL a provision was made to include a 16-page form in each number of the JOURNAL, or 32 pages on which to carry these abstracts. This will give us a total of 384 pages or approximately the same number of pages as has been devoted to this purpose in the YEAR BOOK.

"3. It is planned to set a definite rate of compensation for the preparation of abstracts. This has been set at $2.00 per printed page for abstracts prepared from publications in the English language, and $3.00 per printed page for abstracts prepared from articles published in other languages. The rate is about the same as that which has been paid for abstracting in the past where it was found necessary to pay anything at all for this service.

"4. I am informed by the Lord Baltimore Press, the company which has the contract for publishing the 1933 volume of the YEAR BOOK, that the new arrangement will effect a saving in publication of approximately $600.00 to $700.00. I doubt, however, if the ASSOCIATION will gain to this extent, as the new arrangement will very likely bring new expenses that have not been anticipated.

"Please let me have your vote on this matter promptly as we have no time to waste if the first abstracts are to appear in the March number of the JOURNAL."

With respect to the YEAR BOOK, Chairman DuMez stated that Volume 22, for 1933, is being printed and that the copy for Volume 23, for 1934, will not be completed for about six months. It had been recommended to hold Volume 22 until Volume 23 is completed and issue them in one binding, but it was felt that the delay would bring criticism.

After discussion and on motion of Arny-LaWall the Committee was authorized to proceed with the publication of Volume 22 of the YEAR BOOK.

Messrs. Dunning, Fischelis and Holton requested to be excused at this time as they had to leave the meeting.

76. Representation of the A. Ph. A. on the National Retail Drug Code Authority. The Chairman stated that this subject had been included in the program to provide an opportunity for a full consideration of it.

The Secretary reported that a letter had been received from NRA since the last meeting of the Executive Committee, outlining certain necessary changes in the By-Laws of the ASSOCIATION respecting membership if the ASSOCIATION is to be permanently represented on the National Retail Drug Code Authority, and that NRA had been advised that the ASSOCIATION would not meet until August 1935, when the proposed changes would be considered. In the meantime, the secretary continued to serve as temporary representative of the A. PH. A. on the Code Authority and as its secretary-treasurer.

Referring to the discussion of the subject at the meeting of the Executive Committee on July 17th, the secretary stated that he had believed it necessary to continue his additional work on the Code until the Loss Limitation provision and the Budget of the Code Authority could be settled, which had been delayed much longer than had been expected. Decision on the former question had been reached on September 21st, and on the latter on December 13th. At the December meeting of the Code Authority, he had therefore requested to be relieved of the work additional to membership on the Code Authority, through the employment of an accountant to take charge of the budgets, which was done promptly, and by the selection of some one to take full charge of the work of the Code Authority which will be done as soon as possible.

The Secretary estimated that at certain periods the Code work had taken up as much as one-third of his time, much of which, however, could be made up, and stated the amount of salary which the Code Authority had paid him on account of the additional work, all of which salary payments had been deducted from his salary from the A. PH. A.

It was the general opinion that the secretary should be relieved of this additional work as promptly as satisfactory arrangements can be made, and it was understood that the secretary will advise the Council of these arrangements as soon as they can be completed.

No action was taken by the Committee.

NOTE: The members of the Council have been furnished with further details in this connection through copies of correspondence between the president and the secretary.

On motion of LaWall-Philip, the meeting adjourned at 7:20 P.M.

(*Motion No. 27*) *It is moved by Kelly that the Minutes of the Executive Committee as presented herewith be approved by the Council and that the actions of the Executive Committee become the actions of the Council.*

A vote on this motion will be called for in about ten days.

The Secretary is now prepared to report that Mr. W. S. Elkins of Decatur, Georgia, was elected as Executive Secretary of the National

Retail Drug Code Authority and took up his duties on March 15, 1935. Mr. Elkins will have charge of the office of the Code Authority and of its administration.

The Secretary will continue as a member of the Code Authority, representing the A. PH. A., until further action of the Council, and as secretary-treasurer of the Code Authority, and will act in an advisory capacity.

E. F. KELLY, *Secretary.*

COMMITTEE REPORTS

REPORT OF COMMITTEE ON WEIGHTS AND MEASURES.

It was the thought of President R. L. Swain and others that the work of this Committee should be coördinated very closely with that of the Committee on Prescription Tolerances. It is recognized that the accuracy of prescription compounding depends in no small measure on the accuracy displayed in weighing and measuring quantities of ingredients. Unless balances, scales, weights, graduates and other weighing and measuring devices are accurate, it is impossible to provide accurate compounding and dispensing.

In order to determine the present status and accuracy of the weighing and measuring devices in the pharmacies throughout the United States it was decided to address the Department of Weights and Measures of each state and ask for information as to what supervision is exercised by the state over weighing and measuring devices in retail drug stores. These departments were also requested to supply copies of their annual reports and any information which they might have in their possession bearing upon the questions in which the Committee is interested.

As a result of communications addressed to the 48 states on this subject a variety of replies was received consisting in most instances of copies of laws and regulations and in a few instances of reports and comments.

It appears that the economic wave which has overtaken state activities, has resulted in a curtailment of the publication of reports by various departments.

No replies of any kind were received from the States of Alabama, Colorado, Idaho, Illinois, North Carolina, Rhode Island and Washington although several follow-up letters were sent.

The following states indicated that drug store weighing and measuring devices are in a satisfactory condition: California, Florida, Georgia, Nevada, Oregon, South Carolina and Utah.

The following states have no Departments of Weights and Measures: Louisiana, Mississippi and Missouri.

In Oklahoma the activities of the Weights and Measures Department are handled by the State University.

In New Jersey the Department of Weights and Measures reported as follows:

"For the fiscal year ending June 30, 1933, 513 prescription scales were examined of which 472 were found accurate, 32 required adjustment and 9 were condemned.

"Four thousand fifty-seven (4057) metric weights were examined, of which 3804 were found accurate, 185 required adjustment and 68 were condemned.

"Two hundred and seventy-one (271) troy weights were examined, of which 236 were found to be accurate, 21 required adjustment and 14 were condemned.

"Eight thousand, four hundred and eighty-eight (8488) apothecary weights were examined, of which 6943 were found accurate, 539 required adjustment and 966 were condemned.

"Three thousand, one hundred and forty-six (3146) glass graduates were examined, of which 3020 were found accurate and 126 were condemned."

In the State of Wisconsin for the fiscal year ending June 30, 1932, seven hundred and thirty-five (735) prescription weights were examined, of which 19 were adjusted, 23 condemned for repairs and one condemned.

In the District of Columbia for the year ending June 30, 1933, four hundred and forty-one (441) prescription scales were examined and tested. Of these 412 were approved with adjustment, 44 were tested and 27 were condemned for repairs and one was confiscated.

For the same period 7965 prescription weights were tested, of which 7754 were approved and 211 were confiscated.

The following comment of the Superintendent of Weights, Measures and Markets of the District of Columbia on the situation in the District is pertinent: "When this department began testing prescription scales and weights several years ago many of them were found in very bad condition, but, due largely to the annual inspections made, conditions with regard to such scales and weights have greatly improved."

We all know that if inspections are made in any field of activity conditions are good. When no inspections are made, conditions are apt to be bad because of the carelessness which results from the knowledge that no one is checking up or policing a given situation.

It is a well-known fact that the quality of drugs and medicines dispensed improves when there is knowledge that the products are subject to inspection and test. The same holds true for weights and measures or any other activity.

The Chairman of your Committee feels that a general survey of reports of state, county and municipal departments of weights and measures should be made to determine, so far as possible, the conditions of weights and measures in the pharmacies of the United States. When this survey has been completed an effort should be made to call to the attention of the pharmacists of the United States such facts and figures as may be developed, and recommendations should be offered to improve the situation, if necessary. Our report this year is therefore in the nature of a progress report, and it is suggested that the incoming committee continue the work that has been undertaken, endeavoring to provide as complete a survey as possible of the situation in the near future.

ROBERT P. FISCHELIS, *Chairman.*
(Signed) W. MAC CHILDS H. W. PARKER
ROWLAND JONES C. S. PIERCE.

STATE PHARMACEUTICAL ASSOCIATION MEETINGS.

APRIL.

Georgia, 22–23, Albany.
Kansas, 9–11, Wichita.
Missouri, 23–25, Kansas City.
Oklahoma, 16–18, Tulsa.

MAY.

Florida, 14–16, Jacksonville.
Illinois, 21–23, Quincy.
New Mexico, 22–23, Clovis.
North Carolina, 13–15, Winston-Salem.
South Carolina, 8–9, Spartanburg.

JUNE.

Alabama, 18–20, Birmingham.
Arkansas, 11–13, Jonesboro.
California, 23–26, San Diego.
Colorado, 18–20, Estes Park.
Connecticut, 27–28, New London.
Indiana, 18–20, Lake Wawasee.
Kentucky, 18–20, Crab Orchard.
Maine, 26–28, Rangeley.
Massachusetts, 17–19, Swampscott.
Michigan, 18–20, Grand Rapids.
Mississippi, 17–19, Tupela.
New Hampshire, 23–26, Dixville Notch.
New Jersey, 19–21, Atlantic City.
New York, 18–21, Lake George.
North Dakota, 11–13, Fargo.
Pennsylvania, 17–21, Cruise on Lake Erie.
Rhode Island, Watch Hill.
Texas, 3–6, Dallas.
Utah, Salt Lake City.
Vermont, 16–18, Fairlee.
West Virginia, 17–18, Parkersburg.
Wisconsin, 25–27, Green Bay.
Wyoming, 24–25, Casper.

JULY.

Montana, 5, Anaconda.
Ohio, 16–19, Cedar Point.
Tennessee, 15–18, Memphis.

AUGUST.

Idaho, 4–6, Portland.
Oregon, 4–6, Portland.
Washington, 4–6, Portland.

DEATH OF MRS. F. C. GODBOLD.

Mrs. Elizabeth Godbold, widow of our late member, F. C. Godbold, New Orleans, died at the home of her brother, Dr. H. V. Arny, Montclair, N. J., April 9th, aged 77 years.

EDITORIAL NOTES

REPORTS OF THE INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY.

Through the courtesy of Major General H. L. Gilchrist, editor of the *Military Surgeon*, the Library of the AMERICAN PHARMACEUTICAL ASSOCIATION has received reports on the Congress of Military Medicine and Pharmacy for 1923, 1925, 1927, 1929, 1931 and 1933. All of the foregoing reports were made by William Seaman Bainbridge, Captain M.C.F., United States Naval Reserve. These meetings were held consecutively, in the order given above, in Rome, Paris, Warsaw, London, The Hague and Madrid.

On behalf of the ASSOCIATION thanks are extended to those whose names are mentioned herewith.

S. L. HILTON, REMINGTON MEDALLIST.

Announcement has been made by Secretary Dr. Hugo H. Schaefer, of the election of S. L. Hilton to receive the Remington Honor Medal for 1935. He is chairman of the Council and a former president of the A. PH. A. and treasurer of the Pharmacopœial Convention.

S. L. HILTON.

During the erection of the American Institute of Pharmacy, Dr. Hilton made a daily visit to the site and was helpful in many ways prior to the construction of the headquarters. Further reference to the recipient of the award will be made in due time.

DEAN C. B. JORDAN HONORED.

At the close of the banquet and program of the Fifth Annual Druggists Business Conference, recognition of Dean Jordan's twenty-five years of distinctive service as the Dean of Purdue University, School of Pharmacy, was made a special feature. The members of the faculty of Pharmacy presented Dean Jordan with a handsome illuminated parchment. The program was under the direction of President E. C. Elliott.

Tributes were made in short addresses by President Robert P. Fischelis of the AMERICAN PHARMACEUTICAL ASSOCIATION, F. V. McCullough, *secretary* of the Indiana Pharmaceutical Association, President E. A. O'Harrow, of the Indiana Board of Pharmacy, and J. K. Lilly.

THE TWELFTH INTERNATIONAL PHARMACEUTICAL CONGRESS.

Among the subjects that will be considered at the Twelfth International Congress are the following: The medico-pharmaceutical scope, the limitation of pharmacies, pharmaceutical regulations—control of patent medicines and prices to be charged, management of pharmacies, pharmaceutical service in social insurance, the question of employment in pharmacies, pharmaceutical terms.

INTERNATIONAL CONGRESS OF HOSPITALS.

The Fourth International Congress of Hospitals will be held in Rome, May 19–26, 1935. An elaborate program has been prepared and reduced rates will be effective. The Secretary-General is Dr. Edorado Licorio, Ospedale S. Spirito, Rome.

IDAHO ENLARGES PLANT GARDEN.

Drug plants from many parts of the world are now being grown in the greenhouse of the campus of the University of Idaho, southern branch. This extensive plant cultivation was made possible by the Government's F. E. R. A. funds for employing undergraduate pharmacists to care for the garden.

The purpose of the experiment, according to Prof. E. O. Leonard, director of the division of pharmacy, is to determine the possibilities of increasing the medicinal content of drug plants.

PERSONAL AND NEWS ITEMS.

The address of **President Robert P. Fischelis,** of the AMERICAN PHARMACEUTICAL ASSOCIATION—before the Third Annual Pharmaceutical Conference of the College of Pharmacy, of the University of Michigan—was published in *Science* of March 29th.

Dr. Charles R. Mann as director for 12 years of the American Council on Education is to be honored on May 3rd by that organization. This will be the 18th annual meeting and the general topic, "Unoccupied Areas in Education." The speakers will be Sidney B. Hall, Richmond; Rev. George Johnson, of Catholic University; John G. Bowman, University of Pittsburgh; Harold G. Campbell, New York City; William F. Ogburn, University of Chicago; A. S. Pratt, W. W. Charters and Fred B. Robinson, College of the City of New York.

It is contemplated to build a new Naval Hospital in Washington, located on the site of the present Naval Medical Center at 23rd Street and Constitution Ave. The new facilities would include space for the Medical School and the Naval Dispensary, in addition to the regular hospital building. The site is immediately opposite to the AMERICAN INSTITUTE OF PHARMACY.

Adolph S. Ochs, publisher of *New York Times,* died April 9th. His remarkable record and influence as a publisher commanded attention and respect, for to a very large extent the insistence of factual accuracy as a basic standard of reputable journalism in the United States was due him. All publications and the readers owe him a debt of gratitude.

Harry L. Schrader, Baltimore, has donated a letter of **H. P. Hynson** accepting membership in the Wedgewood Club and thanking the father of Mr. Schrader for his interest; a number of the *Druggists Circular,* October 1874. The latter contains a report of the Louisville meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, John F. Hancock, president. Among other items is a National Formulary of 1888, belonging to A. P. Sharp, also a number of bottles of fluidextracts and granules; a glass mortar sign and a set of troy weights—16 ounces to $^1/_2$ ounce.

Ambrose Hunsberger, Jr., son of our fellow-member, has been placed in charge as chief of he research division of John Wyeth & Bro. Mr. Hunsberger attended Philadelphia College of Pharmacy and Science, is a graduate of Princeton University, and continued graduate work at the University of Pennsylvania. Recently, he has been on the staff of the Biochemical Department of Philadelphia General Hospital.

Dean D. B. R. Johnson was honored by members of the faculty and friends on April 5th, in commemoration of his fifteen years of deanship of Oklahoma School of Pharmacy. **Herman Jones** was chairman of the committee on invitations. Prof. Ralph Bienfang has been active in the arrangement and President Clyde Miller has appointed a committee on the memorial.

John P. Jelinek, prominent St. Paul retail pharmacist, was injured severely when struck by an automobile. After Mr. Jelinek had recovered sufficiently to be taken home from the hospital, Mrs. Jelinek suffered a fall resulting in a severe leg injury. Both, however, are recovering rapidly.

Dr. F. E. Stewart and **Warren H. Poley** were the honored guests at the annual Founders Day of the Philadelphia College of Pharmacy and Science. Dr. Stewart graduated in 1876 and Mr. Poley in 1875. Dr. F. E. Stewart was for many years chairman of the Committee on Patents and Trade Marks of the AMERICAN PHARMACEUTICAL ASSOCIATION and in many other ways contributed valuable work to the ASSOCIATION and in the establishment of the Council on Pharmacy and Chemistry.

James E. Hancock, chairman of the Procter Memorial Fund Committee, is heading the movement to have the Frigate Constellation reconditioned and brought to Fort McHenry and become part of the Museum being established at the Fort, in the restoration of which Mr. Hancock has been very active, in fact the leader. This is now a National shrine and the active part which Baltimore had during the history of the Constellation suggests its location here.

Dr. A. R. Bliss, Jr., dean of the School of Pharmacy of Howard College at Birmingham, Ala., will read a paper before the International Physiological Congress in Leningrad and Moscow in August 1935. Dr. and Mrs. Bliss will be members of a group of physicians headed by Dr. J. S. McLester, *President-Elect* of the American Medical Association and Dr. A. J. Carlson of the University of Chicago; they leave Chicago on their journey July 25th.

Dr. Paul N. Leech was the speaker at the meeting of Chicago Branch, A. PH. A., April

16th, on the subject: "Some Topics of Interest to the Pharmacist and Physician."

Dean Ernest Little, of the Rutgers University College of Pharmacy, will be honored at a testimonial dinner here on May 20th, in recognition of his service to pharmacy as president of the American Association of Colleges of Pharmacy.

The dinner, to be held at the Hotel Robert Treat, is being sponsored by the Northern New Jersey branch of the AMERICAN PHARMACEUTICAL ASSOCIATION and the Alumni Association of the Rutgers University College of Pharmacy. Oscar Scholz, Jr., is in charge of reservations for the event.

Magazine sections of the Sunday papers (April 14th) carried the story of the expedition of **Clyde Eddy** through the canyons of the Colorado. It is a well-told thrilling story. Relative to the dangers and experiences in the Grand Canyon, as most of our readers know, Mr. Eddy gave a series of illustrated lectures on the subject. He is also known to members for his interest in the ASSOCIATION work.

Our fellow-member, **J. Leon Lascoff,** has made an extensive purchase from the John Wanamaker collection of drug jars and mortars. The mortars range from the 16th to the 19th century and are largely of English, French and Spanish design. The drug jars range largely about 1800 and all of them are interesting specimens—the purchaser has these on display in his pharmacy.

SOCIETIES AND COLLEGES.

THE INTER SOCIETY COLOR COUNCIL.

The annual meeting of the Inter Society Color Council was held at Columbia University College of Pharmacy, New York City, on February 21st. The AMERICAN PHARMACEUTICAL ASSOCIATION was represented by Dr. H. V. Arny as official delegate; E. N. Gathercoal was a delegate of the U. S. Pharmacopœia.

ACADEMY OF SCIENCES AND AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The annual stated meeting of the National Academy of Sciences will be held under the presidency of Dr. W. W. Campbell, in the build- of the academy at Washington, on April 22nd, 23rd and 24th. The autumn meeting will be held at the University of Virginia on November 18th, 19th and 20th.

The spring meeting of the Executive Committee of the American Association for the Advancemeat of Science will be held in New York City.

DOCTORS AND DRUGGISTS' MEETING.

Over 100 doctors, hospital workers, nurses and druggists attended the first annual get-together party sponsored by the San Angelo (Texas) Retail Druggists' Association. Members of the Tom Green (Eight) County Medical Society were guests of honor.

OFFICERS OF THE DISTRICT OF COLUMBIA PHARMACEUTICAL ASSOCIATION.

The following officers were elected by the District of Columbia Pharmaceutical Association:

President, A. C. Taylor; *Vice-Presidents,* J. G. Biggs, F. M. Campbell, M. Goldstein, G. W. Mathews, T. A. Moskey, H. J. Wener; *Secretary-Treasurer,* W. Bruce Philip.

At the meeting on April 9th, pictures were shown illustrating the manufacture of glassware by Whitall Tatum Co. and it is the aim of the Association to continue programs of pictures illustrating manufacturing processes.

THE NEW YORK PHARMACEUTICAL COUNCIL.

The New York Pharmaceutical Conference has been reorganized and since April 1st the organization is now known as the New York Pharmaceutical Council made up of local pharmaceutical associations, fourteen such local groups are represented in the Council.

The convention was addressed by Hugo Mock and Secretary E. L. Newcomb of the National Wholesale Druggists' Association, and George W. Mather, Secretary of the New York State Board of Pharmacy. The following officers were elected:

President, F. L. Grennie, New Dorp, Staten Island; *Vice-Presidents,* Henry Dansen, the

Bronx; Joseph Setaro, Long Island City, and Harry Brode, Flushing; *Secretary*, Hugo Schaefer, Manhattan; *Treasurer*, Fred G. A. Schaefer, Brooklyn; *Members of the Board of Governors*—George Gotteman, Brooklyn; Dr. C. P. Wimmer, Manhattan; Morris Brodkin, the Bronx; Charles Timen, Queens County, and Edward McCrum, Richmond County.

LEGAL AND LEGISLATIVE.

CODE EXTENSION.

At the time of this writing the Senate is continuing its study of the operation and effects of the NRA. The officials are determined to keep the code structure intact and workable pending passage of new legislation to extend the law beyond June 16th.

COPELAND BILL DEFERRED BY SENATE.

Senate action on the Copeland food and drug bill (S. 5) was indefinitely postponed when its author, Senator Royal S. Copeland of New York, asked that it be placed back on the calendar rather than passed as amended. This action was taken after a brief but stormy session in which the Senate adopted, by a vote of 44 to 29, an amendment, offered by Senator Josiah Bailey of North Carolina, to prevent multiple seizures on charges of misbranding which did not involve imminent danger to health. Earlier, Senator Copeland had announced that he would prefer no new legislation to such action, and after adoption of the Bailey amendment he made good his threat by having the measure placed back on the calendar.

PRICE-CONTROL BILLS IN CONGRESS.

A bill to restrict the price discrimination section of the Clayton Act has been introduced in the house by Representative Carl Mapes of Michigan. This bill would amend Section 2 of the act by striking out all of the qualifications of the rule against price discrimination, which have made the act difficult to enforce. These qualifications include necessity of proving creation of a monopoly, and provide for price differences based on quality or quantity or to meet competition. The Mapes bill (H. R. 4995) would make it unlawful for any person engaged in commerce either directly or indirectly to discriminate unfairly or unjustly in price between different purchasers of commodities within the jurisdiction of the Federal government. H. R. 6246 has been introduced by Representative Compton I. White, of Idaho. This would make it unlawful for any manufacturer to charge different prices to a chain store or mail-order organization and to competing independent retail establishments.

NATIONAL RECOVERY ADMINISTRATION.

In a memorandum sent April 12th to all code authorities and State and Regional NRA Directors, the National Recovery Administration emphasized the distinction between mandatory and permissive cost formulas or cost systems. Only mandatory systems which are integral parts of codes when approved, or those specifically approved by NRA, are subject to enforcement. There are two types of cost formulas or cost systems—those that are mandatory and used in connection with selling below cost provisions in codes, and those that are permissive and used for educational purposes only to the extent found practicable.

The National Recovery Administration also announced new rules regarding contributions from industry to the costs of code administration designed to relieve small firms of an inequitable burden, lessen multiple assessments, simplify collections and permit the rate of contribution to be reduced at any time.

NARCOTIC TRAFFIC.

Another successful raid has been made by Federal agents bringing to light further information regarding illegal sale of narcotics; a book was found giving the names and addresses of possible purchasers.

The Narcotic Division is also studying the addiction to marihuana. It is said to be used in cigarettes and in other forms with tobacco, and the Department advises the enactment of state laws controlling the use.

SALES TAXES.

The following states have provided legislation creating sales taxes: Missouri, ½%; Maryland, Oklahoma, 1%; Arizona, Arkansas, Colorado, Idaho, Illinois, Indiana, Iowa, Michigan, Mississippi, North Dakota, South Dakota, Utah, Washington, West Virginia, Wyoming,

2%; California, 2½%; North Carolina, Kentucky, Ohio, 3%.

A graduated sales tax is in existence in New Mexico and Vermont.

Bills for sales taxes are still pending in Alabama, Connecticut, Georgia, Kansas, Maine, Massachusetts, Minnesota, Missouri, Montana, Nebraska, Nevada, New Jersey, North Carolina, North Dakota, Oklahoma, Rhode Island, South Dakota and Wyoming.

RETAIL CODE AUTHORITY.

The NIRB has approved an amendment to the code for the retail trade permitting incorporation of the code authority for the retail drug trade and of local committees for the trade. W. S. Elkin, Jr., well-known pharmacist, Atlanta, Ga., has been appointed executive secretary of the National Retail Drug Code Authority. Together with Paul Pearson, assistant to the secretary, he will aid E. F. Kelly, secretary-treasurer of the code authority, in handling the work of the headquarters office.

COMMISSIONS FOR PHARMACISTS IN U. S. ARMY.

Congressman Jed Johnson, Oklahoma, introduced H. R. 7485 on April 12th. This bill has been referred to the Committee on Military Affairs, hence, a reference only to the bill is made.

Pharmacists under this bill must be graduates of a recognized college of pharmacy; Section 4 provides for promotion to grade of first lieutenant after three years of service; further advancements to captain, major, lieutenant colonel and colonel after respective, consecutive services of 6, 12, 20 and 26 years.

ARIZONA.

Governor B. B. Mocur has signed a bill drafted by the Arizona Pharmaceutical Association and passed by the Arizona legislature, creating a state board of pharmacy.

After a debate, during which Representative Porter, woman member in the House, declared that cosmetics were as much of a necessity for women as shaving cream was for men, cosmetics were stricken from the luxury tax list.

COLORADO.

House Bill 557, which makes the state laws conform to federal laws governing sales of hypnotic drugs, was passed by the senate.

GEORGIA.

The uniform narcotic bill, designed to eliminate sales of illicit drugs in Georgia, was passed by the house. A sub-committee of the Senate Finance Committee is studying the chain store tax bill passed by the house.

CALIFORNIA.

A 10 per cent tax on proprietary medicines and cosmetics, with but few exceptions, is provided in a bill recently introduced into the California legislature.

Under a bill, the California board of health would have the power to regulate the sale of any drugs that it may deem dangerous, injurious or poisonous.

NEW JERSEY.

The New Jersey Fair Trade Bill, patterned after the California Fair Trade Law, has been signed by Governor Harold G. Hoffman. The final clause of the measure puts the law into effect immediately.

MARYLAND.

Maryland has passed House Bill No. 70, amending the Narcotic Law to more nearly conform with the Federal Law and the proposed uniform state laws; No. 219 authorizing the State Board of Health to adopt regulations to bring the standard of foods and drugs in Maryland up to that required under the Mapes Act; No. 604 prohibiting medical shows and the distribution of sample drugs from door to door.

H. 145 has passed the house and the senate, proposing to prohibit the retail sale and distribution of barbital and other hypnotic and somnifacient drugs except on the prescription of a licensed physician, dentist or veterinarian. The drugs mentioned are to include barbituric acid, sulphonethylmethane (trional), sulphonmethane (sulphonal), diethylsulphon diethylmethane (tetronal), paraldehyde and chloral or chloral hydrate or chlorbutanol.

OREGON.

Oregon's Fair Trade Bill is framed to protect trade-mark owners, distributors and the public against injurious and uneconomic practices in the distribution of articles of standard quality under a distinguished trade-mark, brand or name; placing certain limitations for resale upon commodities; and to repeal Chapter 311, Oregon Laws, 1933.

WASHINGTON.

Washington's Fair Trade Act relates to the sale of certain articles and commodities, providing protection for trade-mark owners, dis-

tributors and the public against injurious and uneconomic practices in the distribution of articles and commodities of standard quality under a distinguished trade-mark, brand or name, prescribing penalties, and declaring that this act shall take effect immediately.

BOOK NOTICES AND REVIEWS.

Urinary Analysis and Diagnosis. By LOUIS HEITZMANN, M.D. With a chapter on the Determination of the Functional Efficiency of the Kidneys. By Walter T. Danreuther, M.D., F.A.C.S., Professor of Gynecology and Director of Department, New York Post-Graduate Medical School and Hospital, Columbia University. Sixth edition. Cloth. Price $5.00. Pp. 385, with 131 illustrations. Baltimore: William Wood and Company, 1934.

The text of this edition has been thoroughly revised and brought up-to-date by extensive changes and additions. The work is presented in three parts. Part I includes a discussion of the physical and chemical properties of urine, the normally occurring organic and inorganic constituents of urine under normal and pathological conditions, and the abnormal constituents including the proteins and carbohydrates. Efficient methods of identification are given, and in some cases the more simple quantitative methods are described. Considerable space is devoted to the identification of those normal constituents that might be confused with the abnormal. Part II includes the general procedures for microscopic examination of urine, the identification of crystalline and amorphous urinary sediments of both organic and inorganic substances, pus, blood cells, the various types of epithelial cells, mucus, cylindroids, casts, animal parasites, microörganisms of the hyphomycetes, saccharomycetes and schizomycetes groups, and extraneous matter which might be confusing such as foreign vegetable and animal fibres. Part III is a continuation of the microscopic examination of urine with particular emphasis on the microscopic picture presented by various pathological conditions of the genito-urinary tract and the interpretation of these findings. There is a discussion of the tissue changes which occur under pathological condition and an effort is made to unravel the confusion in the nomenclature applied to the various types of kidney lesions. Chapters on technique and interpretation of several methods of measuring kidney function and the hormone tests for pregnancy complete the book.

In criticism it might be stated that it is unfortunate that the quantitative methods included have been limited to those simpler procedures which require little apparatus, but these omissions are offset by the detail and completeness of the material presented. The sections devoted to microscopy are most comprehensive including many original plates which show both normal and pathological findings, and are evidences of the author's vast experience. This book can be recommended as a complete reference for clinical urinary analysis, and should prove invaluable to technicians and to those physicians who do their own laboratory work. It should also prove of value as a text in courses on urinalysis.—JOHN C. BAUER.

The Romance of Exploration. An interesting and well-illustrated book has been published by Burroughs Wellcome & Co., entitled, "Romance of Exploration and Emergency First Aid from Stanley to Byrd." It is largely an illustrated description of the display at the Century of Progress Exposition and presents the important achievements in discovery during the last two centuries together with illustrations depicting events of the explorations and means for first aid. It impresses the importance of compact and reliable medical equipment and the close relationship of drugs to discoveries and progress of civilization.

Dechema-Monographs No. 49–56 (6th volume), 8 lectures delivered at the conference of the Dechema, Deutsche Gesellschaft für chemisches Apparatewesen E. V. held at Wuerzburg in 1933, with 9 tables and 98 illustrations accompanying the text, Verlag Chemie G. m. b. H., Berlin, 1934, published by the Dechema, Deutsche Gesellschaft für chemisches Apparatewesen E. V. Price RM. 5.—(for member RM. 4.—)

In this volume, Professor W. J. Müller proposes a classification of chemical reactions according to the state of aggregation of the substances involved, which is important from an educational point of view, and interesting to the practical man in so far as he is able to grasp

the comparable points. Other interesting subjects are included.

We acknowledge with thanks the following reprints from The Wellcome Chemical Research Laboratory (The Wellcome Foundation, Ltd.). T. A. Henry, D.Sc., *Director*.

"The Irritant Constituent of Anti-Leprotic Oils," by H. Paget, J. W. Trevan and A. M. P. Attwood.

"Modified Cinchona Alkaloids, Part I. Apoquinine and Apoquinidine," by T. A. Henry and W. Solomon.

"The Alkaloids of Alstonia Barks, Part I. *A. Constricta*," F. Muell, by T. M. Sharp.

"The Alkaloids of Alstonia Barks. Part II. *A. Macrophylla*, Wall; *A. Somersetensis*, F. M. Bailey; *A. Verticillosa*, F. Muell; *A. Villosa*, Blum," by T. M. Sharp.

"The Action of the Cinchona and Certain Other Alkaloids in Bird Malaria. Part II," by G. A. H. Buttle, T. A. Henry and J. W. Trevan.

We are in receipt of a reprint from the Department of Pharmaceutical Research of the Shanghai Science Institute on the Chemical Composition of Daphne Genkwa by Manso Nakao and Kwong-Fong Tseng, courtesy of the *Journal of the Shanghai Science Institute*.

We are in receipt of the following reprints from the F. E. Chidester: "Diabetes and the Thyroid Glands." "Biochemical Attacks on Insanity." "Dehydrogenated and Unsaturated Substances in Relation to Canver, Vitamins and Hormones." "Endocrine Function, the Sympathetic Nervous System, and Calcium."

Dr. John C. Krantz, Jr., has favored us with the following reprints: "Action of Trichlorethylene on Perfused Vessels of the Frog." "A Note on the Assay of Reduced Iron." "A Note on the Arsenic Test for Reduced Iron." "Pharmacological and Chemical Studies of the Digitalis Group. I. Adonis, Apocynum and Convallaria." "Influence of Cesium Ions on Oxygen Demand of Sewage."

Receipt is acknowledged of Proceedings of the American Association of Colleges of Pharmacy for 1934.

We have received a reprint from the German Apotheke on *Healing and Spice Drugs* for information of their citizens. Also the following dissertation: "Über die Alkylierung und Acylierung der Hydroxylgruppen des Morphins, sowie über eine neue Darstellung des Diacetylmorphins. Inaugural-Dissertation zur Erlangung der philosophischen Doktorwürde vorgelegt der Mathematisch - Naturwissenschaftlichen Abteilung der Philosophischen Fakultät der Universität Basel von Anton Baselgia, Apotheker aus Somvix (Graub.). (Dr. H. Zörnig and Dr. H. Fischer.)

AWARD IN BIOCHEMISTRY.

The biochemist to receive the first of the Eli Lilly and Company award has been selected by unanimous vote of the committee. The committee which under the rules served with Edward Bartow, State University of Iowa, President-Elect, as chairman, consisted of H. T. Clarke, Columbia University; L. J. Henderson, Harvard University; W. R. Bloor, University of Rochester; H. B. Vickery, Connecticut Agricultural Experiment Station; P. A. Shaffer, Washington University; and D. D. Van Slyke, The Rockefeller Institute.

Dr. Willard Myron Allen, to whom the award is given, has done outstanding work in developing a sharply defined biological test for the action of the *Corpus luteum*, the use of this test is to isolate in crude form a potent extract, and then the complete purification of the hormone, now called "progestin."

Satisfactory progress is being made in the subscriptions to the fund raised to perpetuate the memory of **Prof. H. G. Greenish.** The memorial will take the form of a free place in the College of the British Pharmaceutical Society. The Council of the Society has agreed to provide the free place at the College and the grant meets other expenses.

Drs. A. C. Frazer and V. G. Walsh of St. Mary's Hospital Medical School, London, report success in treatment of pneumonia with olive oil. The olive oil is emulsified and then injected into the veins. The treatment is being applied in other diseases.

CALIFORNIA MEDICAL SOCIETY ENDORSES SICKNESS INSURANCE.

Following the session of the House of Delegates of the American Medical Association in Chicago in February, a meeting of the house of delegates of the California Medical Association was held in Los Angeles. A special committee of five, appointed by the house of delegates of the California Medical Association in 1934, submitted a report of a survey of health care in California and a plan for the administration of health insurance. This committee, with an ad-

visory council, had made the survey, which involved a study of medical practice as conducted by physicians, dentists, osteopaths, hospitals and clinics, and a direct study of the health care of the public obtained through 48,000 questionnaires secured from families by field workers and by mail. The cost of the survey was approximately $80,000.00 of which some $25,000.00 was supplied by the California Medical Association and the remainder through an appropriation by the government.—*Jour. A. M. A.* for April 6th.

DIVISION OF MEDICINAL CHEMISTRY PROGRAM AT NEW YORK.

The program of the division of medicinal chemistry, prepared for April 25th, is being composed entirely of invited addresses. These are as follows: George Merck—"Tercentenary of Chemical Industry." W. F. von Oettingen—"The Development of Industrial Medicine with Special Reference to the Problems and Tasks of Industrial Toxicology." Michael Heidelberger—"The Chemistry of Bacterial Proteins." Vincent du Vigneaud—"Present Status of the Oral Administration of Insulin." Drs. Small, Mosettig and Eddy—"Latest Progress in the Search for Morphine Substitutes. I. The Morphine Series. II. The Phenanthrene and Dibenzofuran Series." Wm. P. Murphy and Isabel Howard—"The Use of Intramuscular Liver Extract." Movies.

FEDERAL ALCOHOL CONTROL ADMINISTRATION.

Section 4 of the Regulations Relating to Non-Industrial Use of Distilled Spirits and Wine (General Regulations, Series 4) is amended by adding thereto the following:

(*d*) Members of the distilled spirits industry and the distilled spirits rectifying industry, engaged in the sale or other disposition of distilled spirits other than alcohol, for industrial use as above defined, in containers of a capacity in excess of one gallon, shall ship or deliver such distilled spirits directly to the industrial user thereof, and shall not sell or otherwise dispose of such distilled spirits to any person who is not actually engaged in the use of distilled spirits for industrial purposes.

SAFER INSECTICIDES FOR VEGETABLES DEVELOPED BY AGRICULTURE DEPARTMENT.

Wider use of pyrethrum and derris seems to be the answer to the grower's need for keeping his leafy vegetables free from residues of the more toxic insecticides, according to W. H. White, in charge of truck crop and garden insect investigations, U. S. Department of Agriculture. Chemists and entomologists of the department have long sought substances that could be depended on to protect growing crops against destructive insect pests and still leave nothing harmful to human beings on the product to be marketed. Scientists working on the problem have found that minute quantities of two plant products—derris and pyrethrum—kill many insects feeding on truck crops and are less likely than most inorganic insecticides now in common use to leave harmful residues. Insecticides made from derris and pyrethrum are now on sale in most seed and drug stores in the United States. Plant specialists of the department are investigating the possibilities of growing insecticidal plants in this country.

In 1916 **Edward V. Sheely** was elected president of the Tennessee Pharmaceutical Association, and in 1917 he was appointed a member of the State Board of Pharmacy, on which he served the allotted term of five years. When in 1927, he was prevailed upon by the political powers in command to accept the Memphis postmastership, he moved into the new environment and shouldered the new responsibilities with characteristic zest and confidence. He did not lose touch with pharmacy during this tenure of office.

George M. Gales has resigned as member of the National Retail Drug Code Authority. The code authority will consider Mr. Gales' action at its next meeting.

Carleton B. Joeckel, library authority now on the faculty of the University of Michigan, has been appointed Professor of Library Science in the Graduate Library School of the University of Chicago. Dr. Joeckel's appointment becomes effective October 1, 1935.

ALUMNI MEETING, PITTSBURGH COLLEGE.

The Alumni Meeting of the Pittsburgh College of Pharmacy will be held at Cedar Point, Sandusky, July 16th to 20th. E. Bruce Dawson, of Cleveland, has been elected to act as Secretary. Among the speakers will be, Prof. James H. Beal, Dean C. Leonard O'Connell and Dr. George D. Beal.

The Program Committee is preparing a Year Book to be presented to each member of the Alumni.

IDAHO PHARMACY LAW FAILS.

Due to amendments designed to kill the pharmacy bill proposed by the Idaho Association the enactment of the measure failed.

UTAH CHANGES PLACE FOR MEETING.

Utah State Pharmaceutical Association will meet in Salt Lake City instead of Provo; the date of the meeting has not been fixed.

NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION.

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee.

Manuscripts should be sent to Editor E. G. Eberle, 2215 Constitution Ave., N. W., Washington, D. C.

All manuscripts should be typewritten in double spacing on one side of paper 8½ x 11 inches, and should be mailed in a flat package—not rolled. The original (*not* carbon) copy should be sent. The original drawings, not photographs of drawings, should accompany the manuscript. Authors should indicate on the manuscript the approximate position of text figures. All drawings should be marked with the author's name and address.

A condensed title running page headline, not to exceed thirty-five letters, should be given on a separate sheet and placed at the beginning of each article.

The method of stating the laboratory in which the work is done should be uniform and placed as a footnote at end of first page, giving Department, School or College. The date when received for publication should be given.

Numerals are used for figures for all definite weights, measurements, percentages, and degrees of temperature (for example: 2 Kg., 1 inch, 20 5 cc., 300° C.). Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example: one hundred years ago, about two and one-half hours, seven times).

Standard abbreviations should be used whenever weights and measures are given in the metric system, *e. g.*, 10 Kg., 2.25 cc., etc. The forms to be used are: cc., Kg., mg., mm., L. and M.

Figures should be numbered from 1 up, beginning with the text-figures (line engravings are always treated as text-figures and should be designed as such) and continuing through the plates. The reduction desired should be clearly indicated on the margin of the drawing. All drawings should be made with India ink, preferably on white tracing paper or cloth. If coördinate paper is used, a blue-lined paper must be chosen. Usually it is desirable to ink in the large squares so that the curves can be more easily read. Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches). Photographs intended for half-tone reproduction should be securely mounted with colorless paste.

"Figure" should be spelled out at the beginning of a sentence; elsewhere it is abbreviated to "Fig.;" per cent—2 words.

The expense for a limited number of figures and plates will be borne by the JOURNAL; expense for cuts in excess of this number must be defrayed by the author.

References to the literature cited should be grouped at the end of the manuscript under the *References*. The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full-sized figures included in parentheses). The sequence followed in the citations should be: Author's name (with initials), name of publication, volume number, page number and the date in parentheses. Abbreviations for journals should conform to the style of *Chemical Abstracts*, published by the American Chemical Society.

(1) Author, A. Y., *Am. J Physiol.*, 79, 289 (1927).

Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION'S annual meeting become the property of the Association and may at the discretion of the Editor be published in the JOURNAL. Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The Editor will appreciate comments from Board of Review and Committee on Publication, members, authors and others interested.